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SAFETY ENFORCEMENT DIVISION
CALIFORNIA PUBLIC UTILITIES COMMISSION

PREPARED SUR-REPLY TESTIMONY
OF
MARGARET FELTS

SUPPORTING ATTACHMENTS
CHAPTERS 1 - 9

San Francisco, California
June 30, 2020

CHAPTER 1
EXHIBITS

Aliso Canyon OII

Responses to SED Testimony

I. INTRODUCTION

[PLACEHOLDER FOR SHORT DESCRIPTION OF BACKGROUND AND RELEVANT EXPERIENCE. CVS WILL BE INCLUDED AS ATTACHMENTS]

II. PURPOSE OF TESTIMONY

The purpose of my testimony is to describe the industry standards[1] related to gas storage operations that existed as of October 2015, and to respond to the opening testimonies of the Safety Enforcement Division ("SED") and the Public Advocates Office ("CA Advocates")…. .

INDUSTRY STANDARDS

In considering whether SoCalGas acted "reasonably" with respect to historic operation and maintenance of the Aliso Canyon gas storage field it is necessary to assess the relevant industry standards that applied at the time of, and prior to, the incident.

Regarding best practices or "industry standards"[2] in the gas storage industry, prior to September 2015 and the publication of API Recommended Practice 1171, "Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs", there were no documented industry-wide procedures that would have been considered standards. Even now API RP 1171 remains a "Recommended Practice", is in the process of implementation, and does not qualify as an industry standard. Of course, even absent formal documented standards, there were in fact industry standard practices. Based on my knowledge and experience from working at XXX other gas storage fields over the past XX years I have observed first hand many of these standard practices.

Following is a summary table comparing applicable DOGGR regulations in effect at the time of the SS-	DOGGR	API RP 1171	INDUSTRY	PRACTICE AT

Commented [SFJ1]: Consider removing any that we aren't really relevant

[1] In this context "industry standard" refers to prevailing practices that were generally acceptable within the gas storage industry.

[2] In this context "industry standard" refers to prevailing practices that were generally acceptable within the gas storage industry.

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25 release, the API RP 1171 standards, common industry practices and those being utilized at Aliso Canyon as of October 23, 2015:**STORAGE**				
ATTRIBUTE	**REGULATIONS**	**"SHALL" REQUIRMENTS**	**PRACTICE**	**ALISO CANYON**
Maximum Operating Pressure	Defined by permit (3,600 psi for Aliso)	Not specified	36% of storage reservoirs operate higher than original discovery (delta pressure)	Original discovery only. Delta pressure approved by DOGGR but never implemented
Mechanical Integrity Test - Original	Within 3 months of initial operations	Well mechanical integrity tests required	Tested during well completion operations	Tests completed during well conversion - completion
Mechanical Integrity Test - Operations	Annual temperature surveys	Wells monitored for unexpected conditions	Annual temperature surveys	Wells visited daily. Temp logs ran annually.
Well Casing Design	Dual barrier not required	Dual barrier not required	87% of all gas storage wells are single barrier	Packer installed. Single barrier operation.
Cement Bond Log	Required	Required	Typically completed	Completed on all wells
Max Age of Storage Wells	None specified	None specified	Average age of repurposed wells is 78 years	SS-25 was 61 years old at the time of failure
Well Integrity Monitoring	Not required	Monitor for annular pressure	No programmatic application	Integrity logs run during well reworks
Wellsite Inspections	Not specified	Annual inspections	Highly variable	Daily visits. Monthly inspections.

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Pressure Monitoring	Surface pressures weekly	Not required	Highly variable	Recorded weekly
Reservoir Integrity Monitoring	Not required	Material balance required periodically	Completed periodically	Inventory verification completed periodically
Production Casing Cement-to-Surface	Not required	Not required	Highly variable	Completed in new wells post 1990
Emergency Shutdown Valves	Not required	Not required. Operator to evaluate need based on criteria.	Some surface ESDs installed. Only 3% have SSSv	All IW wells with surface ESDs. SSSVs attempted but proved to be unreliable
Surface and Subsurface Safety Valve Testing	Not required	At least annually	Highly variable	Semi-annually
Emergency Response Plan	Not required	Required	Typically completed	Completed
Well Flow Testing	Not required	Not specified	Highly variable	Periodic well flow tests for erosion control
Operation & Maintenance Procedures - Wells	Not required	Required	Typically completed	Completed
Risk Management Plan	Not required	Required	Typically informal only with little or no documentation	Informal pre-SIMP (Inspect and Replace). SIMP in early implementation
Well Kill System	Not required	Not required	Not installed	Installed on all injection/withdrawal wells

Due to this wide variation in regulations and industry practice, there were no consistent industry standards in effect for underground gas storage. Through active participation in various industry organizations such as the American Gas Association (AGA), the Interstate Natural Gas Association of America (INGAA) and the American Petroleum Institute (API),

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storage operators recognized this lack of consistent standards and opted to collectively develop a recommended practice. Due to the widely varying practices throughout the industry, it took three years to develop a consensus and complete the effort, ultimately leading to API RP 1171, published in September 2015, one month before the SS-25 incident.

In addition to API RP 1171, and subsequent to its publication, members of the same three industry organizations mentioned above developed a joint industry task force ("JITF") paper, "Underground Natural Gas Storage – Integrity & Safe Operations" published in July 2016. The authors of that paper recognized the wide disparity of actual operations throughout the U.S. gas storage industry as compared to those in API RP 1171 and stated that *"Operators have projected full conformance with API 1171 following a final rulemaking could take 7-10 years. . ."* PHMSA published an interim final rule effective January 2018, but the industry is still awaiting a final rule, now expected to be issued in the first quarter 2020. The industry recognizes and has adopted an industry standard in RP 1171, but for most operators, actual field facilities and operations are not yet compliant with those standards and are not expected to be for the next several years.

Add comments on SCG meeting or exceeding industry standards here per previous information supplied to SED?

In response to SoCalGas discovery requests SED has produced numerous documents that it alleges are indicative of "industry standards." It is important to note that the research and case study papers provided by SED, are not indications of gas industry standards. These papers are intended to provide additional data and insight to field operators for consideration in their specific circumstances; however, they are not an indication of what was being applied throughout the broader oil and gas industry, much less the gas storage sector. Depending on the specific circumstances, the techniques described in these papers may be applicable at certain storage fields, including Aliso Canyon. For example, temperature and noise logging were routinely used at Aliso Canyon for leak detection, and casing cathodic protection was used on selected wells where it was determined to be beneficial.

Commented [SFJ2]: Also note, maybe in a footnote, that in response to questions regarding what SED thinks SoCalGas should have done regarding XX issue, SED objected and responded that it is not SED's job to know how to operate a gas storage field. This shows that they don't know what should have been done.

Do we have a disconnect here in that we (a) state above that there really were no industry standards, and then (b) applaud SCG for meeting and exceeding industry standards?

1) WELL FAILURE ANALYSES

In connection with alleged violations 1-60, SED allleges that *"SoCalGas failed to perform failure investigations, failure analyses or root cause analyses on failed Aliso Canyon wells despite more than 60 well casings experiencing leaks, four having parted casings, and several*

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wells having casing corrosion identified. Therefore, SoCalGas lacked important information and background to properly anticipate the extent and consequences of corrosion in its other wells, including well SS-25."[3]

SED's assertion, which is based solely on Blade's report, mischaracterizes 63 well casing issues of varying cause and degree as "leaks." SED's and Blade's assertions appear to be premised on the assumption that these casing issues were somehow similar to the circumstances that led to the failure at SS-25. In fact, Blade's report combines a number of different well conditions, including perforations intentionally made by SoCalGas and stage collar leaks. These well conditions have no relation to corrosion and which present little risk or reason for concern. Blade's list of 63 casing failures includes the following:

- Eleven casing leaks identified by Blade were actually discovered in wells during the conversion of the field to underground gas storage or before that time. One of these leaks happened in 1952 and occurred during the original drilling of an oil and gas production well. How can this leak, which occurred 20 years before the conversion of the field to gas storage, be attributed to SoCalGas storage operations? Further, the other ten leaks that were identified during the conversion to underground gas storage simply validate the process that SoCalGas used to inspect and repair, if necessary, all wells prior to putting them into service for gas storage. This is exactly how a conversion process should be carried out in a depleted oil or gas field.
- One leak occurred in 1979 during initial drilling and completion operations for new storage wells. This leak had nothing to do with underground storage operations and was rectified prior to the well ever being put into service for gas storage.
- Seven of the casing leaks identified by Blade were actually leaking stage collars. Stage collars are devices used for multi-stage cementing of production casing in wells. The stage collar is essentially a sliding valve in the casing that can be opened to allow cement to be pumped outside of the casing into the annulus between the production casing and the wellbore. It is quite common for stage collars to not seal completely upon closing the sliding valve after the cementing procedure. This situation is easily remedied with a simple casing repair. More importantly, these stage collar leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well, and no follow-up investigation or failure analysis is required to determine the obvious root cause of these particular casing leaks, which are common across the entire oil and gas industry.
- One casing leak identified by Blade was due to incompletely plugged water shut-off holes discovered in 1977. A water shut-off test is a well operation required by DOGGR and involves placing holes in the production casing and then conducting a pressure test to confirm the integrity of the seal created by the cement behind the casing. After

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Commented [SFJ4]: Please specify

Commented [SFJ5]: Please specify

Commented [SFJ6]: Please specify which

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the test, the holes have to be cemented and closed. In certain instances, if the holes are incompletely closed and plugged, further work is required to seal the casing. This is quite common. Water shut-off leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well, and no follow-up investigation or failure analysis is required to determine the obvious root cause of these particular casing leaks.

- A further eight of the casing leaks identified by Blade were not leaks at all. These were situations where there were indications of a potential leak, but further investigation by SoCalGas, such as pressure testing, confirmed there was no leak.
- Lastly, Blade's list of casing leaks included double and triple counting situations where two or more leaks were attributed to a single event. These should have only been counted once.

Commented [SFJ7]: Please specify

In summary, rather than 63 casing leaks, as alleged by SED, in fact there were less than half that number. 31 documented casing leaks which were not related to stage collars or water shut-off holes. Further, only two of the actual casing leaks documented by Blade (FF-34A, Frew 3) were of the scale where gas was known to have migrated some distance in the subsurface away from the wellbore. In addition, outside of the SS-25 incident, in none of the documented casing leaks did any gas escape to the surface.

1. **SoCalGas Detected, Investigated, and Remediated Well Casing Issues Consistent With Industry Standards.**

Regarding the response of SoCalGas and post-leak investigations into the well failures, prior to 2014 there was little formal, documented industry guidance as to when or how to perform an appropriate incident investigation. In April 2014, API published Recommended Practice 585, "Pressure Equipment Integrity Incident Investigation." While this Recommended Practice does not apply to gas storage operations, it is relevant insofar as it documents and details procedures for investigating failures and near misses in related pressure equipment. Notably, even if API 585 did apply, SoCalGas would have complied with its requirements. In addition, SoCalGas' practices with respect to investigation of well casing failures met gas storage industry standard practice.

[add brief summary of what API 585 requires including quote re purpose of tier 1]

SoCal's practices regarding well failures and the subsequent investigation into the causes was consistent with the gas storage industry. Minor casing leaks or mechanical issues were repaired with little if any follow-up investigation. If a pattern of failures developed, (i.e. erosion from sand production), then a more detailed investigation was conducted and a risk management plan was employed to minimize the potential impact of recurrence. In the cited example, SoCalGas routinely conducted sand flow tests to determine critical gas flowrates for sand production in their storage wells. Even though the more formalized approach as

Commented [SFJ8]: As discussed, conducting a casing inspection log during workover after identifying an issue would qualify as level 1 per 585.

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detailed in RP 585 to categorize each casing integrity failure into one of three levels based on severity was not available until April 2014, SoCalGas did perform more thorough "Level 2" investigations as defined in RP 585 into the two well incidents discussed above (FF-34A, Frew 3) where there was migration of gas in the subsurface away from the wellbores.

Commented [SFJ9]: As discussed, please add discussion of what was done on these Level 2

It is also critical to note that of the casing failures documented by Blade, there was no pattern identified that would have led SoCalGas staff to determine that similar incidents would occur at any of the other gas storage wells. According to Blade:

> *"Wells with casing failures were distributed throughout the Aliso Canyon Field. Nothing seems unusual regarding the casing failures near SS-25 when comparing them to the casing failures in the rest of the field. The depths of casing failures ranged from the wellhead to below 8,000 feet, and no general pattern is apparent." (Blade Report, page 204)*
>
> *"52% of the leaks were between surface and 4,000 ft with no trend of leak count vs. depth."* (Blade Report, page 166)
>
> *"The failure and casing leak rate for the gas storage wells is around 50%, implying that well age does not correlate with casing failures."* (Blade Report, page 204)

Corrosion of well casing is a common occurrence in most oil, gas and underground gas storage fields. When one puts steel into the ground in a corrosive environment, a certain amount of corrosion is going to occur. At Aliso Canyon, there were no patterns of failure related to the well location in the field, the age of the wells, or depth of the leak. There were no local "hot spots" in the field where casing corrosion was more prevalent. All prior well failures had been identified by SoCalGas within a timely manner, were contained locally, and were mitigated properly. Blade's report did not identify the *"important information and background to properly anticipate the extent and consequences of corrosion in its other wells, including well SS-25"* because such properly correlated information was not available to SoCalGas.

2. There is No Evidence that Corrosion on the Surface Casing of SS-25 Caused the Failure on the 7 inch Production Casing

In connection with violations 83, 84 and 85, related to SoCalGas' alleged failure to discover specific corrosion problems on Well SS-25, SED states:

> *"Blade identified a total of 58 through-wall-metal-loss holes in the 990-foot deep, 11-3/4-inch diameter steel surface casing walls of well SS-25. Fifty of the steel surface casing holes in SS-25 were identified at depths ranging between approximately 150 feet and approximately 195 feet. The through-wall-metal-loss holes were identified using various technologies, including caliper, UCI and HRVRT. Camera logging data were*

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consistent with the technology logging data, with photographs matching the sensory logging tools' metal loss locations."

While it is unclear, SED testimony appears to assume that the 58 holes in the surface casing were due to corrosion; caused the corrosion and resulting failure on the SS 25 production casing, and could have been identified using the various technologies listed in the statement. This logic is flawed and without support. First, SED's testimony fails to mention that Blade concluded that *"The holes are likely a consequence of the axial rupture."*[4] What that means is the 58 holes that the SED testimony infers were caused by corrosion were actually caused by the rupture of the production casing and the subsequent pressure surge. By Blade's own conclusion, these holes had absolutely nothing to do with corrosion on the surface casing. This is akin to blaming an automobile accident on a crumpled fender when the fender was only damaged during the accident itself.

Secondly, overlooking the flawed logic regarding what created the holes in the first place, SED's testimony implies that various technologies were available which could have easily identified these holes. Once again this is incorrect. Blade was able to analyze the surface casing and identify the holes only because the production casing had been cut off and extracted from the SS-25 well after the incident. Extracting the production casing exposed the surface casing for inspection and examination. During the normal operation of the SS-25 well, the production casing, of course, would have remained cemented in the well. As such, caliper logs, cameras and casing inspection logs would not have been able to evaluate the integrity of the surface casing because due to the presence of the production casing.

SED's testimony also suggests that corrosion problems on the SS-25 well were the result of the production casing not having been cemented to surface and the lack of a corrosion protection mechanism.[5] In the 1970's, when many of the Aliso Canyon wells were completed or converted for gas storage, it was not industry standard for underground gas storage wells to have the production casing cemented to surface. Rather, it was common practice that the production casing was cemented in a fashion such that the storage reservoir was isolated and cement extended above the storage zone for several hundred to a few thousand feet. This was the case in the SS-25 well. Of the 31 U.S. states with gas storage operations in October 2015, only 6 states had added requirements that production casing be cemented to surface. California was not one of those states. In addition, it is not practical nor prudent to attempt to remediate a well by attempting to squeeze cement behind the production casing in those areas where the well was originally not cemented. The amount of damage caused to the casing would far outweigh any potential benefit of such remedial work.

Commented [SFJ10]: Which was the case several hundred or a few thousand? Not clear from the preceding sentence

Commented [SFJ11]: And that was only for new wells right?

[4] [cite]
[5] [cite]

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As to the second issue of the lack of a corrosion protection mechanism on the production casing, the axial rupture of the production casing occurred at a depth of 892 feet, which was inside the surface casing of the well. The Blade document clearly states, *"While a cathodic protection system would have provided corrosion protection to the 11 ¾ in. casing, it would not have protected the 7 in. casing inside the 11 ¾ in. casing."* Thus, an independent corrosion protection mechanism like cathodic protection would not have been useful in this case, contrary to the suggestions made in the SED testimony.

3. WELLBORE INTEGRITY RISK ASSESSMENT

In connection with alleged violation 74 SED asserts that *"SoCalGas did not have any form of risk assessment focused on wellbore integrity management, including lack of assessment of qualitative probability and consequence of production casing leaks or failures."*[6]

SED's assertion is incorrect. Starting in 2007, SoCalGas implemented a program which included conducting wellbore integrity evaluations at Aliso Canyon and performing remedial work, if necessary, based on the results. The program was a "Replace and Inspect" initiative, meaning that when a storage well was being worked on, anything that could be replaced would be replaced, and what could not be replaced would be inspected. This included the inspection of the integrity of production casing in the storage wells. This program included detailed evaluations of the wellbore integrity and replacement of well hardware equipment such as wellhead valves and the well tubing and packer. This proactive program resulted in SoCalGas taking six wells permanently out of service and abandoning them based on their downhole condition.

Commented [SFJ12]: As discussed, SoCalGas was ahead of industry on this correct?

Commented [SFJ13]: Out of how many logged ?

The 2007 initiative ultimately led to the development of the Storage Integrity Management Program ("SIMP") in 2014. SoCalGas was in the process of implementing the SIMP at the time of the SS-25 incident. For gas storage wells, this includes threat identification and risk assessment based on a variety of factors, remediation as necessary, development of preventative and mitigative measures, and record-keeping requirements. This program was very consistent with the recommended practice for well integrity evaluation detailed in API RP 1171. As explained above API RP 1171 was published until shortly before the incident after SoCalGas had proposed the SIMP program and which contemplates 7-10 years .

During this same general time period, early 2000's to 2015, some operators within the gas storage industry were beginning to transform their well integrity evaluations in a similar manner as SoCalGas. Historically, work related to well integrity issues in the gas storage industry had always been of a reactive nature in dealing with problems as they were

[6] [cite]

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identified. It was beginning to be recognized by the industry that the technology existed to allow operators to be more proactive and to evaluate the condition of downhole equipment before failure occurred so that the situation could be remedied in an appropriate manner. Thus, the efforts of SoCalGas in this respect put them in the group of gas storage operating companies that were pioneers in leading the storage industry into a new, more proactive approach to well integrity management.

SED further criticizes SoCalGas for not initiating a storage integrity management program in 2009 even though such a program was recommended by Mr. James Mansdorfer, who was the Storage Engineering Manager at the time. As stated above, this timing and this assertion are incorrect. In fact, SoCalGas had already initiated its own Replace and Inspect storage integrity management program two years earlier, in 2007, which led to six wells being removed from storage service.

SED faults SoCalGas for relying upon temperature and noise surveys for monitoring the casing integrity of gas storage wells at Aliso Canyon. However, SED concedes that SoCalGAs' casing integrity monitoring program had the full approval of the DOGGR.[7] At the time of the SS-25 incident, less than one-third of the states with gas storage operations in the U.S. required any type of periodic mechanical integrity testing on gas storage wells (10 states out of 31). One of those states was California, which approved the use of temperature logs, and noise logs as needed, for mechanical integrity testing. Also, at the time of the SS-25 incident, only one state with gas storage operations in the U.S. required periodic temperature and noise surveys for gas storage wells. While it is easy for the SED to look back with hindsight on the SS-25 incident and criticize SoCalGas for their casing integrity monitoring program, it should be noted that SoCalGas was actually following DOGGR requirements and exceeding the U.S. gas storage industry standards by implementing annual temperature surveys on all storage wells at Aliso Canyon.

In the heading for Section 2 of the SED testimony, it is asserted that there was a "*lack of assessment of qualitative probability and consequences of production casing leaks or failures*" by SoCalGas. Interestingly, nothing further is mentioned in the SED testimony within Section 2 in respect of this allegation. However, if one does look into this matter further, the following is observed:

- As stated previously, the Blade list of casing leaks at Aliso Canyon indicates a total of 31 documented leaks across approximately 40 years (1975 to 2015).
- Given 114 total storage wells at Aliso Canyon, this translates to a casing leak frequency of less than 0.007 casing leaks per well per year at Aliso Canyon. That is a very, very small number. Further, recall that not including the SS-25

Commented [SFJ14]: Was this number static over the period or were new wells drilled?

[7] [cite to project approval letter and DOGGR response to comments re sufficiency of noise and temp logging]

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well, only two of these leaks identified by Blade would be considered Level 2 incidents (FF-34A, Frew 3) where gas was known to have migrated some distance in the subsurface away from the wellbore.

- Prior to the SS-25 incident, there had never been a casing leak which resulted in storage gas being released at the surface to the atmosphere.
-

Given the above, how then would the SED suggest that SoCalGas conduct a qualitative probability assessment for something that has never happened before? It simply isn't possible. There had never been a surface release of storage gas at Aliso Canyon caused by a casing leak prior to the SS-25 incident. During the operation of the SS-25 storage well, there had never been an anomalous temperature, noise or pressure survey that indicated any kind of casing leak or gas migration. Based on historical data from Aliso Canyon, the probability that the SS-25 incident would have occurred is 0%. Unfortunately, the SS-25 incident did occur. However, this event was completely unexpected, and it occurred despite SoCalGas following guidelines established and approved by DOGGR, and practices which exceeded the industry standards in wellbore integrity management of gas storage wells.

4. DUAL MECHANICAL BARRIER

a. Dual Mechanical Barrier well configuration Is Not Industry Standard

SED asserts – *"SoCalGas did not have a dual mechanical barrier system in the wellbore of SS-25, instead leaving the 7-inch production casing as the primary barrier to the gas."*

SoCalGas response – At the time of conversion of the Aliso Canyon field to gas storage operations, the injection/withdrawal wells were designed with tubing on a packer and an installed subsurface safety valve ("SSSV"). The wells were operated in a single barrier configuration, utilizing annular flow to achieve the high flowrates necessary for storage operations. By flowing gas in the annulus between the tubing and production casing, effectively only a single barrier, the production casing, existed between the storage gas and the surrounding strata in those parts of the well where the production casing was not cemented. During the early years of gas storage operation, the SSSVs proved to be operationally problematic and unserviceable. The wells were then recompleted to remove the operational elements of the SSSV, leaving an open port between the tubing/casing annulus and the tubing.

Commented [SFJ15]: Separate dual mechanical barrier and SSSVs into separate sections

In respect of storage well completions with SSSVs, the attempts of SoCalGas to incorporate these valves into their well design was a proactive, industry leading initiative into safety. Ultimately, the SSSVs had to be abandoned due to inherent problems with the valves. However, the fact remains that SoCalGas was an industry pioneer in exploring safer

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operations of its gas storage fields. Many other operators who later attempted to use SSSVs, especially deep-set valves, experienced similar problems and also removed them from their gas storage wells. According to the previously referenced JITF report, it is estimated that only 3 to 5 percent of current gas storage wells have SSSVs installed.

Commented [SFJ16]: AS discussed, SSSV's should be a separate section and I don't think we need to spend as much time on it. All we need to say is:
1. SSSVs originally installed were removed due to operational issues
2. Not industry standard – see JITF report
3. And even Blade said that they wouldn't have made a difference here

Regarding the matter of SoCalGas not having a dual mechanical barrier system in the wellbore of well SS-25, the simple fact is that dual barrier well design in underground gas storage was never even remotely close to being something that could be considered an industry standard. The JITF paper "Underground Natural Gas Storage – Integrity & Safe Operations" published in July 2016 (page 21) includes the following statement:

> *"Operators have designed and installed a number of different well completions depending on their historical experiences, practices, and site-specific conditions. A common well completion case referenced herein contains production casing without tubing"*

The referenced JITF report goes on to state on Page 55 that *"10-25 percent of natural gas storage wells have a full tubing string set into an isolation packer."* This range was subsequently updated by the JITF in a September 2016 presentation, "Tubing and Packers in Underground Natural Gas Storage: Safety and Reliability Considerations". In this presentation, a poll of U.S. Underground Natural Gas Storage Operators indicated that approximately only 13% of existing gas storage wells have tubing and packer installed within the wellbore, and would thus be equipped to operate in dual barrier mode. This estimate represents an 80% response rate (13,485 out of a total of 17,500 storage wells). As such, the single barrier well completions at Aliso Canyon were consistent with the industry standard and the vast majority (87%) of all gas storage wells in operation.

Commented [SFJ17]: Add cite to source

Within this section of the SED testimony, the point is raised once again about the use of temperature surveys to monitor casing integrity in gas storage wells. The SED document states, *"The catastrophic SS-25 casing leak showed that using temperature surveys to confirm mechanical integrity of casing was a flawed concept."* As was stated previously in this document, through the use of annual temperature surveys in the gas storage wells at Aliso Canyon, SoCalGas was actually following DOGGR guidelines and exceeding the U.S. gas storage industry standards for monitoring casing integrity in the wells.

Commented [SFJ18]: Either delete or consolidate with the other section where we deal with this issue. I think we can just note in a footnote all the places where SED addresses the issue and then rebut it.

5. INSPECTION OF WELLBORE WALL THICKNESS

SED asserts, in connection with violations [ ] that *"SoCalGas did not have internal policies that required inspection and measurement of the wall thickness of wellbores at Aliso. Instead, SoCalGas used techniques that detected and fixed leaks only after the event occurred."*[8]

[8] [cite]

SoCalGas response – The SED testimony notes the following:

> *"SoCalGas had no internal policies on wall thickness inspections because the company assumed that regulatory compliance was being adhered to by running annual temperature surveys in accordance with the Aliso Canyon Monitoring Plan and the project approval letter dated 1989 requiring an annual mechanical integrity test (MIT)."*

The SED testimony is incorrect in that SoCalGas did not have to assume that regulatory compliance was being adhered to through the running of annual temperature surveys, rather SoCalGas had DOGGR approval that their monitoring program was indeed in regulatory compliance. Further, as has already been noted, the SoCalGas monitoring program was meeting and exceeding industry standards.

The SED testimony goes on to state:

> *"A wall thickness inspection provides a leading indicator of possible casing integrity issues. The noise and temperature logs results are trailing indicators because the leak has to already have happened to be detected."*

The inference in the SED testimony is that SoCalGas could have, and should have, done better than simply running temperature surveys and periodic noise logs. The SED testimony faults SoCalGas for not also running casing inspection logs. However, the criticism by SED directed at the SoCalGas policies and practices is myopic and ignores the lessons learned by the gas storage industry over the past 60+ years.

In order to run a casing inspection log in a well such as the SS-25 well at Aliso Canyon, it is necessary to conduct a workover on the well. A workover entails killing the gas production from the well by filling the wellbore with fluid, and then pulling all of the tubing out of the wellbore. Only at that point can a casing inspection log be run in the well. This is because the casing inspection logging tools used by the gas storage industry in 2015 could only evaluate a single string of pipe. It was not possible to evaluate the integrity of the production casing by running the logging tool down the tubing string. Therefore, to accomplish what the SED testimony suggests should have been done, which is to run casing inspection logs in wellbores that had historically given no indication of problems with the production casing, it would have been necessary to run a workover on the well.

The previously referenced JITF document, "Underground Natural Gas Storage – Integrity & Safe Operations" published in July 2016, contains a detailed discussion in Section 2 of their document titled, "Lessons Learned from Historical Underground Natural Gas Reservoir Storage Well Events (API 1171 Sections 8.4 and 8.7)". The JITF analyzed 61 unplanned storage well releases of gas in the U.S. between 1953 and 2010. Their analysis showed that

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approximately 1/3 of the 61 incidents on record happened during well interventions, or well workovers. The JITF further note that the industry statistics show the likelihood of such an unplanned release event occurring in a gas storage well is classified as "very unlikely" to "extremely unlikely" or "remote". Thus, it is quite significant that approximately 1/3 of such incidents occurred during well workovers.

The JITF analysis mirrors what the U.S. oil and gas industry has long known, which is the most likely time to have an accident or an incident on a well is when that well is being worked over. Anytime pipe is being pulled out of a well, such as when tubing is being removed so that a casing inspection log can be run, the chance of an incident increases dramatically. In their 2016 presentation, "Tubing and Packers in Underground Natural Gas Storage: Safety and Reliability Considerations", the JITF noted the following about the safety risks and dangers of running casing inspection logs in a gas storage well:

- Advanced tools such as high resolution Vertilog cannot be used to analyze the condition of the casing when tubing is present. Thus, a workover is required.[9]
- The greatest risk for an accident is during intervention or workover.[10]
- Packer slips apply thousands of pounds of force into the casing and leave indentations in the pipe wall. Thus, unseating the packer in order to remove the tubing during a workover can cause scale and ovality which allows gas to leak around the packer.[11]

Commented [SFJ19]: This is important. Are there any good quotes we can use to flesh this out?

As discussed, consider adding cite re PHMSA documentation regarding risk of well interventions.

there is a very good reason why the gas storage industry standard at the time of the SS-25 incident was to use temperature surveys to monitor the integrity of casing rather than a more aggressive strategy of conducting well workovers so that casing integrity logs could be run. It is imprudent for any storage operator to run a workover on their well when there is no reason to suspect there might be a problem with that well, as was the case with the SS-25. To do so only increases the risk and likelihood of an unplanned release of storage gas.

Commented [SFJ20]: Consider current requirements

The Replace and Inspect program, initiated by SoCalGas in 2007, eight years before the SS-25 incident, and the SIMP pilot program of 2014, represented a pioneering approach in the U.S. gas storage industry by SoCalGas to achieve that balance.

Commented [SFJ21]: I think we cover this above. IF you agree we can take this point out.

6. WELL SPECIFIC WELL CONTROL PLAN

[9] [cite]
[10] [cite]
[11] [cite]

SED SUR_REPLY_000014

7. UNDERSTANDING OF GROUNDWATER DEPTHS

SED asserts, in connection with violation 85, that – *"SoCalGas did not employ reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25, until two groundwater wells were drilled for RCA purposes after the October 23, 2015 incident at SS-25."*

SoCalGas response – The SED testimony in this section states that:

"Groundwater accessed the 11 ¾ inch x 7 inch annulus and provided an environment conducive to microbial corrosion."

"The shallow groundwater above 400 feet accessed the poorly cemented 11 ¾-inch surface casing and caused localized corrosion on the outside surface of that casing."

The above statements are important for several reasons. Firstly, much of the SED testimony in this section focuses on the surface casing in the SS-25 well. However, as discussed above in section [ ], there is no conclusive evidence that groundwater or corrosion created any holes in the surface casing. While the groundwater may have "accessed" the surface casing and there might have been corrosion on the outside of the surface casing, there is no evidence that this corrosion compromised the integrity of the surface casing. In fact, Blade concluded that the holes found in the surface casing were likely a consequence of the pressure surge caused by the axial rupture of the production casing (Blade report, Page 119) and, thus occurred post-leak. Since the integrity of the surface casing did not lead to the SS-25 leak, the holes in the surface casing in this section of the SED testimony is irrelevant.

Secondly, both the Blade report (Figure 85) and the SED testimony (Page 43) present a figure which shows the groundwater entering the annulus of the 7-inch production casing and the wellbore below the depth of the surface casing. Thus, the postulated mechanism by which the groundwater accessed the annulus of the 11 ¾ inch surface casing and the 7 inch production casing is via ingress below the surface casing shoe where the production casing is not cemented and then mixing with the fluids outside the production casing which extend upwards into the annulus between the production casing and the surface casing.

All of the above information is important for the following reasons:

- The SS-25 well was drilled in late 1953 and early 1954 by Tidewater Associated Oil Company. At the time that Tidewater drilled the well, they would have set the 11 ¾ inch surface casing at a depth reviewed and approved by the DOGGR, which was below all known shallow groundwater sources based upon local hydrogeology.

Commented [SFJ22]: To discuss organization of this section. Also I think this is one of the areas where we want to start by stating that SED's allegations are unclear. Also ISP

Commented [SFJ23]: If we need these quotes prefer to weave them into narrative where we use them rather than put them up top.

Commented [SFJ24]: Cite to Felt's deposition where she acknowledges that surface casing indicates knowledge of ground water

SED SUR_REPLY_000015

- The purpose of surface casing is to isolate freshwater strata so that they are not contaminated during the drilling and completion of a well. Surface casing is not designed to prevent oil and gas from escaping the well and getting to the surface.
- SoCalGas took over operation of the SS-25 well during the conversion of the Aliso Canyon field to gas storage. This is not an uncommon practice. Of the approximately 400 gas storage fields in the U.S., roughly 80% are in depleted fields that originally were developed to produce oil and gas. Thus, conversion of older oil and gas wells is a common industry practice.
- Given that the purpose of the surface casing is to protect groundwater zones during the initial drilling and completion of the well, which was done in 1953 and 1954, and that the oversight of the surface casing operation was reviewed and approved by the DOGGR, there really is no reason for SoCalGas to have a "*reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25"* as is alleged by in the SED testimony.
- Once SoCalGas took over operation of the SS-25 well, there was no way for them to conduct an evaluation of the integrity of the surface casing. The surface casing was cemented in the wellbore. The production casing was inside of the surface casing and was also cemented. At the time of the conversion of the Aliso Canyon field to gas storage in the 1970's, and even in 2015 at the time of the SS-25 incident, the casing inspection logging tools used by the gas storage industry could only evaluate a single string of pipe. It was not possible to evaluate the integrity of the surface casing by running the logging tool down inside the production casing string.
- Based on the historical data in the Aliso Canyon field, there was no reason for SoCalGas to anticipate there might be a potential problem with corrosion of the production casing at a depth above the surface casing shoe inside the annulus between the production casing and the surface casing, as occurred in the SS-25 well. Blade investigated the occurrences of shallow corrosion throughout the field. Regarding the 27 wells they identified that demonstrated shallow corrosion, Blade determined that almost all of the wells had production casing external corrosion present below the surface casing shoe. Excluding the SS-25, only one well, P-50A, had production casing external corrosion above the surface casing shoe. Thus, corrosion on the production casing above the surface casing shoe was very rare.
- It was not industry standard for underground gas storage wells to have the production casing cemented to surface. Rather, it was common practice that the production casing was cemented in a fashion such that the storage reservoir was isolated and cement extended above the storage zone for several hundred to a few thousand feet. This was the case in the SS-25 well.

Contrary to the SED allegations, SoCalGas is not at fault for not employing a reasonable understanding of the groundwater depths relative to the surface casing shoe and production

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casing of the SS-25 well. Knowledge of the hydrogeology and groundwater is only relevant for the design and implementation of the surface casing. This was done almost 20 years prior to SoCalGas taking over operations of the SS-25 well and was done with DOGGR approval. There was no reason for SoCalGas to expect or anticipate possible corrosion of the production casing above the surface casing shoe because historically, prior to the SS-25 incident, it had only happened once and was very rare. Further, the production casing in the well had been installed and cemented consistent with the industry standards of the U.S. gas storage industry.

8. PROTECTION OF SURFACE CASING FROM EXTERNAL CORROSION

Commented [SFJ25]: Lead this section with ISP

In connection with SED alleged violation 86, SED states that – *"SoCalGas did not have systematic practices to protect surface casing strings against external corrosion. Therefore, SoCalGas did not employ proper understanding of the consequences of corroded surface casings and uncemented production casings."*

SoCalGas response – The SED testimony is critical of SoCalGas for not protecting the surface casing string in the SS-25 well against external corrosion. The SED testimony states:

"During the RCA Investigation Phase 3 evaluation of the condition of the 11 ¾-inch surface casing, holes in the casing were found between 134 feet and 300 feet. These holes were caused by the escaping gas pressure following external corrosion because the casing was neither fully cemented nor cathodically protected leaving the casing exposed to an environment conducive to corrosion."

It is interesting to note that nowhere in their testimony does SED indicate what the consequences were of external corrosion of the surface casing in the SS-25 well. The SED faults SoCalGas for not understanding the consequences of corroded surface casing, yet they do not offer an explanation of what those consequences were. The SED makes no mention in their testimony of any link or connection between corrosion of the surface casing in the SS-25 well and the rupture in the production casing of the well which caused the leak. As was stated in the previous section of this document, corrosion in the surface casing did not provide the ingress for groundwater to access the production casing at the point of the leak. Instead, this was caused by groundwater entering the wellbore opposite the uncemented production casing below the surface casing shoe. This is a completely different issue and will be discussed further in text below.

Returning focus to the corrosion of the surface casing, the SED does note that holes were found in the surface casing between 134 feet and 300 feet, and that these holes were caused by the escaping gas pressure following external corrosion. While that may indeed be true, one must ask, why is this important and what were the consequences?

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- The Blade report (Page 119) clearly states that the holes in the surface casing are a likely consequence of the axial rupture of the production casing. Therefore, the holes in the surface casing did not cause the axial rupture. Rather, the axial rupture caused the holes in the surface casing. Simply put, the holes are a consequence of the leak not a cause of the leak.
- The Blade report (Page 192) also correctly points out that, *"The function of the surface casing is to isolate fresh water sources and also provide a string for drilling the deeper hole for gas storage or oil production. The surface casing is not intended to provide any further barriers to gas or oil."* Thus, SoCalGas cannot be faulted for the condition of corrosion on the surface casing and any escaping gas through holes in the surface casing, which were caused post-leak, because the purpose and objective of surface casing is not to provide a barrier to gas or oil leaving the wellbore.

The SED suggests that the surface casing in the SS-25 well was corroded because the surface casing was neither fully cemented nor cathodically protected. In respect of the quality of the cement behind the surface casing, during the original well drilling operations in 1953 and 1954, attempts were made to cement the 11 ¾ - inch surface casing from 990 feet to the surface. However, during the cementing operations, no cement was returned to the surface indicating an incomplete cementing job. Thus, two top cement jobs were performed where cement is pumped from the surface down behind the surface casing to fill the annulus with cement up to the surface. This is a typical, industry standard operation when there are no surface returns, as was the case in the SS-25 well. It is important to note that for most oil and gas wells, the quality and completeness of cement behind the casing is unknown. The only indication that a surface casing cement job is satisfactory is whether or not cement is returned to surface. It is not customary, and it is considered unnecessary, to run a cement bond log on surface casing. Surface casings are not designed to be a barrier to oil and gas escaping the wellbore. Therefore, in cases such as this one where cement does not return to surface, it is industry standard to remediate the problem by augmenting the cementing procedure with one or more top cement jobs. This is exactly what was done in the drilling and completion of the SS-25 well.

As to the matter of cathodic protection, the SED faults SoCalGas for not having installed cathodic protection to prevent corrosion of the surface casing in the SS-25 well. What the SED testimony does not mention; however, are the limitations and downsides of using cathodic protection in a gas storage field such as Aliso Canyon. Cathodic protection can be an effective tool to prevent corrosion in shallow surface casing strings. While not an industry standard, the technology is used in some gas storage fields with known areas of high corrosion. Recall, Aliso Canyon is not one of these areas as the Blade report documented finding no pattern of corrosion associated with well age, well location, or depth. Thus, given that the SS-25 well is not in a corrosion "hot spot", the storage engineer must balance the

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benefits of using cathodic protection to shield the surface casing versus the potential limitations and downsides which are:

- In areas of high well density, such as the three-well pad at the SS-25 location where wells are located within a few hundred feet of one another, the application of cathodic protection is complex and problematic. If the induced currents are not properly balanced, well casings that are not receiving adequate current will be unprotected and through oxidation reactions will actually see increased corrosion and casing leaks, above what would have occurred with no cathodic protection. In these situations, corrosion of surface casings is actually increased rather than prevented.
- Similarly, within the areal "footprint" of a cathodic protection system, all wells must be protected. The Aliso Canyon field is not only a gas storage field, but there are non-storage operations within the field boundaries accessing shallower hydrocarbon production. These shallow wells are not operated by SoCalGas. If SoCalGas were to install cathodic protection only on its gas storage wells, any shallow hydrocarbon wells operated by a third party would suffer increased corrosion and loss of well integrity because of the cathodic protection currents.
- Cathodic protection typically works very well on protecting surface pipelines or shallow gas gathering lines, where the resistivity of the environment around the steel is known and relatively uniform. However, in the case of vertical surface casing which extends to a depth of approximately 1,000 feet, such as the SS-25 well, the resistivity of the soils can change suddenly and dramatically with variations in depth. This results in an extremely difficult engineering solution to design a cathodic protection scheme that accounts for the rapid changes in soil resistivity and balances the current applied in the cathodic protection system. When multiple wells are added to the equation, such as would be the case around the SS-25 well pad, the problem becomes increasingly more difficult and complex. Any imbalance in the applied current will have the undesired effect of actually making the corrosion problem worse and will increase the risk of gas leaks.

The gas storage industry remains divided as to the effectiveness of cathodic protection systems for storage wells. While it is recognized that there are certain localized conditions where such a system can be beneficial, as a general rule for most gas storage fields, the benefits from a cathodic protection system are questionable. As a result, cathodic protection of surface casing in gas storage fields is not an industry standard.

Lastly, in this section of their testimony, the SED once again raises the issue of the fact that portions of the production casing in the SS-25 well were uncemented. As has been stated previously, cementing of the production casing in gas storage wells to the surface was not industry standard. Rather, the industry standard and common practice was that the

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production casing was cemented in a fashion such that the storage reservoir was isolated and cement extended above the storage zone for several hundred to a few thousand feet. This was the case in the SS-25 well.

9. MONITORING OF WELL PRESSURES

SED asserts, in connection with violation [ ], that *"SoCalGas lacked a real-time, continuous pressure monitoring system for well surveillance, which prevented an immediate identification of the SS-25 leak and accurate estimation of the gas flow rate."*

SoCalGas response – SED's testimony regarding real time pressure monitoring is unclear. At deposition SED's witness clarified that the reason RTPM was important was that it could have enabled SoCalGas to identify and remediate the leak at SS 25, which she believes had been present for years, at an earlier point in time.[12] As discussed in Chapter [ ], the leak and failure at SS 25 was a sudden event and there was no pre-existing leak. Ms. Felts testimony on this issue is also inconsistent with Blade's. As such SED's contention here is simply without any factual basis or support.

Ms. Felts also appears to be arguing separately that RTPM would have provided flow rate data that could have been utilized in the well kill. As a General matter SED's allegations regarding real time pressure monitoring, and the Blade analysis on which it appears to be based, is highly speculative.

……

A real-time continuous pressure monitoring system, as discussed in the SED testimony, is also known as Supervisory Control And Data Acquisition, or SCADA. The SED testimony in this section is critical of SoCalGas for not having a SCADA system in place at Aliso Canyon at the time of the SS-25 incident. SCADA on individual wells was not an industry standard in the U.S. gas storage industry. The Interagency Task Force on Natural Gas Storage Safety notes that 80% of all storage wells within the industry were drilled prior to 1980[13] when SCADA technology was not available.[14] Most gas storage operators now have SCADA systems for their compressor station(s) and central control facility operation, but as of 2015 very few gas storage fields that were developed in depleted oil or gas fields had retrofitted their storage wells with this capability. SoCalGas was in this same position at Aliso Canyon having a SCADA system for their central facilities, but not for monitoring individual well data.

[12] [cite]
[13] Ensuring Safe and Reliable Underground Natural Gas Storage – Final Report of the Interagency Task Force on Natural Gas Storage Safety, October 2016
[14] [cite]

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SoCalGas had purchased and was in the process of installing SCADA for their wells at each gas storage facility, but the system at Aliso Canyon had not yet been installed at the time of the SS-25 incident.

The SED testimony states the following:

"The lack of real-time pressure measurements prevented the immediate identification of the SS-25 7-inch casing failure."

"If this type of system had been installed on SS-25, it would have provided insight into the time of the leak, the opportunity to shut in the well immediately, size of the leak, and the extent of the problem."

The above SED statements, which are copied directly from the Blade report with no further comment, analysis or insights, are either irrelevant or incorrect:

- SED alleges that if a SCADA system were installed, it would have provided insight into the time of the leak and the opportunity to shut-in the well immediately. That SoCalGas could have somehow stopped the failure mid-rupture is pure speculation and lacks factual support. Blade (Page 158) estimates the time of the leak at between 7am and 8am on October 23, 2015. SoCalGas discovered the leak at 3:15pm that same day, and shut-in the well by 3:30pm that same day. For all intents and purposes, SoCalGas, through their regular well monitoring, discovered the leak and shut-in the well almost immediately. A few hours difference in the initial identification of the gas leak and the closing of the well would have made absolutely no difference to the actions and outcome at the SS-25 well.
- Even if SoCalGas had identified a change in pressure a few hours earlier, standard
- SED alleges that if a SCADA system were installed, it would have provided insight into the size of the leak. Presumably, by the "size of the leak", Blade and the SED mean the gas flow rate of the leak. This is impossible. A SCADA system would have provided no information at all as to the magnitude of the gas leak. A SCADA system measures surface tubing and casing pressures and, if equipped with a well flow meter, the injection or production rate at the wellhead. At the time of the leak, the SS-25 well injecting gas at a rate of approximately 70 MMscf per day. That is the rate that the SCADA system would have measured, and that rate has absolutely nothing to do with the magnitude of the downhole gas leak. Once the well was shut-in, the gas injection rate would now be 0, but the SCADA system would still not be measuring any flow rate associated with the gas leak because the SCADA system measures data at the wellhead. As the Blade report states, (Page 158), most of the gas from the leak would have "*flowed through the heavily weathered and vertically fractured top 200-300 ft of formation, however, some would have flowed horizontally through permeable*

Commented [SFJ26]: Would pressure change have actually been detectable?
SoCalGas

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or fractured layers away from the SS-25 well site, and some would have remained in the subsurface." How could a real-time measurement system at the wellhead detect and measure the gas flow rate outside the wellhead flowing through the geologic strata?

- SED alleges that if a SCADA system were installed, it would have provided insight into the extent of the problem. Once again, we have to ask how is this possible? Real-time measurement of surface tubing and casing pressures, as well as gas injection rates, would have yielded no information whatsoever as to the location of the leak in the production casing, the type or size of the rupture in the casing, or as was stated earlier the magnitude of the gas flow rate. SCADA would have yielded no information at all as to the extent of the "problem".

The SED allegations in respect of SCADA are unfounded. SCADA on individual wells was not a gas storage industry standard in 2015 in gas storage fields developed in depleted oil and gas fields (80% of the U.S. gas storage fields). SCADA would not have yielded any useful information as to the location or extent of the gas leak in the SS-25 well. And, most importantly, a SCADA system would have made absolutely no difference in the events that transpired at the SS-25 well on October 23, 2015.

10. WELL RECORDKEEPING PRACTICES

SED asserts – *"SoCalGas did not keep complete, accurate, or accessible records that were necessary for the safe operation and maintenance of its wells at Aliso Canyon Natural Gas Storage Facility."*

SoCalGas response – The Aliso Canyon well files are well organized and contain the appropriate and necessary information. Each well has three separate files; one for the drilling programs, wellbore schematic, rework history and permits; a second file for downhole logs; and a third file for well surveys that includes subsurface pressure data and temperature surveys. As noted by SED, they do not include data related to operations or maintenance of related and supporting facilities, which is consistent within the industry. These data would normally be kept in separate files appropriate for that purpose. For example, the Maximo system stores maintenance data related to storage facilities such as wellhead valves, leakage surveys, etc.

We have reviewed all of the individual well files for the Aliso Canyon gas storage field and, based on our experience, it is our opinion that these records were maintained in a manner exceeding the industry standard for U.S. gas storage operating companies.

Commented [SFJ27]: See felts depo

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Do we need to provide CVs for Tim and Charlie in this document and/or a description of our experience within the US gas storage industry?

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ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-DR45 DATED NOVEMBER 8, 2019)

SOCALGAS RESPONSE DATED NOVEMBER 14, 2019

SoCalGas provides the following Responses to the Safety Enforcement Division (SED) data request dated November 8, 2019 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests SED to SoCalGas.

QUESTION 1:

Provide a summary of all data requests (DR) that SCG has received related to I.19-06-016, including those received from CPUC before and after the initiation of the Investigation, from DOGGR, Blade, and third parties, including parties to I.19-06-016.

a. Provide the summary in the format kept by SCG, in Excel or PDF format.
b. Ideally, the summary would show at a minimum:
   i. the date each DR was received,
   ii. date(s) SCG responded,

iii. short descriptions of each DR and related response.

c. Please Identify all DRs for which SCG did not provide substantive responses.
d. Please identify all DRs to which SCG objected.

RESPONSE 1:

SoCalGas objects to this request on the grounds it is overly broad and unduly burdensome pursuant to Rule 10.1 of the California Public Utilities Commission's Rules of Practice and Procedure; seeks information that is protected from disclosure by the attorney-client privilege and as attorney work product; seeks, in part, information that is equally available to Safety and Enforcement Division (SED); seeks information that is outside the scope of this proceeding, as set forth in the Assigned Commissioner's Scoping Memorandum and Ruling dated September 26, 2019; and is vague and ambiguous with respect to the terms "summary," "substantive responses," and "objected." Subject to and without waiving the foregoing, SoCalGas responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED explained that it was seeking any document SoCalGas maintained regarding data request summaries. SoCalGas and SED agreed that SoCalGas would not create a responsive document but would produce responsive document(s) in its possession which are not protected by the attorney-client privilege or attorney work product doctrine.

a. Please see enclosed document with Bates number I1906016_SCG_SED_DR_45_0000001. SoCalGas provided CPUC-SED a copy of the index of formal, written Blade data requests on November 5, 2019 (see (AC_CPUC_SED_DR_35_0001382) which was previously provided to CPUC-SED on April 26, 2019 in response to CPUC-SED Data Request 35.
b. SoCalGas objects to this request on the ground it does not ask a question.
c. SoCalGas objects to this request on the grounds that it is vague and ambiguous as to the term "substantive response," is overly burdensome, is not reasonably calculated to lead to the discovery of admissible evidence, and to the extent it seeks information that is readily available to SED. SoCalGas has responded to all reasonable discovery requests, and has inserted appropriate objections, as it

deemed necessary.

d. SoCalGas objects to this request on the grounds it is overly burdensome, is not reasonably calculated to lead to the discovery of admissible evidence, and to the extent it seeks information that is readily available to SED.

QUESTION 2:

In a list, please Identify all types of records kept by SCG related to the operation of the Aliso Canyon Underground Storage Reservoir (Reservoir Records)

a. For each item listed, please note the frequency of the records (continuous, hourly, weekly, monthly, annually).
b. For each item, please identify in which format the records are normally kept.
c. For each item, please identify where the records are kept.
d. For each item, please identify the person most knowledgeable at SoCalGas who normally has access to these records.

RESPONSE 2:

SoCalGas objects to this request on the grounds that it is overly broad and unduly burdensome under Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it seeks "all types of records related to the operation of the Aliso Canyon Underground Storage Reservoir," and furthermore, for the same reason, is outside the scope of the proceeding set forth in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas also objects on the grounds the request is vague and ambiguous, particularly with respect to the terms "types," "related to the operation of," "Aliso Canyon Underground Storage Reservoir," and "normally." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed to allow SoCalGas to respond to this request by Monday, November 18, 2019.

QUESTION 3:

Provide Reservoir Records that show the injection volumes, rates, and reservoir

pressure for three days leading up to the failure of Well SS-25.

RESPONSE 3:

SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the phrase "Reservoir Records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows: SoCalGas interprets this request as calling for the Aliso Canyon reservoir pressure, field injection volume, and field inventory for 10/20/15 10/21/15, and10/22/15.

Reservoir Pressure

At Aliso Canyon, surface wellhead pressures in designated pressure monitoring wells are used to determine "bottom hole" or "reservoir pressure." During the timeframe requested, wells Standard Sesnon 5 (SS5) and Ward 3A (W3A) were primarily utilized for this purpose, for the west field and east field, respectively. Please refer to the table below for SS5 and W3A daily wellhead pressures from October 20, 2015 through October 22, 2015.

Date	SS-5 (West Field)	Ward 3A (East Field)
October 20, 2015	2632	2764
October 21, 2015	2641	2764
October 22, 2015	2649	2764

Field Injection Volume

The injection volumes for the Aliso Canyon storage field on the 3 days prior to October 23, 2015 are provided in the table below.

Date	MMcfd
October 20, 2015	104
October 21, 2015	51
October 22, 2015	104

Field Inventory

Date	MMcf
October 20, 2015	77086
October 21, 2015	77184
October 22, 2015	77222

QUESTION 4:

Provide all injection pressure records for Wells SS-25 for three days preceding the failure of Well SS-25.

RESPONSE 4:

SoCalGas objects to this request on the grounds it assumes injection pressure records are maintained for individual wells, and that such records are prepared on a daily basis. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

Underground gas storage wells at Aliso Canyon were not equipped with continuous pressure monitoring. Pressure measurements were collected on a weekly basis. The last pressure reading on SS-25 casing was collected on 10/15/15. The measurement was 2595 psig.

QUESTION 5:

On October 23, 2015, at the time of the failure of Well SS-25, identify the amount of gas owned by SCG stored in Aliso Canyon Underground Storage Unit and the amount of gas stored for others in the Aliso Canyon Underground Storage Unit.

RESPONSE 5:

SoCalGas objects to this request on the ground it assumes gas ownership is specific to a storage field. Subject to and without waiving the foregoing objection, SoCalGas

responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed to allow SoCalGas to respond to this request by Monday, November 18, 2019.

QUESTION 6:

Provide a list of the titles and dates of all Failure Analyses performed on Aliso Canyon well casings or tubing prior to October 23, 2015.

RESPONSE 6:

SoCalGas objects to this request on the grounds it is overly broad and unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure in that there were 114 wells at the Aliso Canyon storage facility on October 23, 2015 and the request is not limited by specific wells or periods of time; seeks information that is outside the scope of this proceeding, as set forth in the Assigned Commissioner's Scoping Memorandum and Ruling dated September 26, 2019; and is vague and ambiguous with respect to the term "Failure Analyses." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed to allow SoCalGas to respond to this request by Monday, November 18, 2019.

QUESTION 7:

Identify by name and title all Metallurgists who were employed by SCG prior to October 23, 2015.

RESPONSE 7:

SoCalGas objects to this request on the grounds it is overly broad and unduly burdensome in that it is not limited to any particular time frame and is vague and

ambiguous with respect to the term "Metallurgists." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

SoCalGas understands "Metallurgists" to mean employees as of October 23, 2015 who have either a degree in metallurgical engineering or metallurgy, or held the position Senior Engineer – Metallurgical. The employees are as follows: Laurie S. Perry, Gerald T. Abbott, Lev Berkovich, Yiyin Chao, Jaffar Chini, Nii A. Dodoo, Zareh Gharapetian, Paul K. Lee, Elizabeth A. Musich, Vadim Rapoport, Gerald W. Routt Jr., Travis T. Sera, Siari S. Sosa, Raymond K. Standford, Marco A. Tachiquin, Ganesh S Venkat, and Armando Zubiate.

QUESTION 8:

For this next set of questions, please reference the Blade Report, page 173, which states in part, A SoCalGas Interoffice correspondence dated August 20, 1991, discussed an 8-5/8-inch casing inspection log showing metal loss and a corrosion protection log run in FF-34A. A recommendation was made to equip FF-34A with cathodic protection (CP). CP was implemented in FF-34A and four other wells according to SoCalGas in response to a February 18, 2018, information request. The documents also states that:

> …The possible regional external casing corrosion problem in the southeastern portion of the field will be further studied and a report issued. Additional investigation of well histories and well logs is required before a recommendation can be made as to whether regional CP is necessary. While casing inspection logs show shallow (1000 feet to 3000 feet ELM), casing metal loss in FF-35C, MA-1A and MA-5A, there is not enough evidence to substantiate a regional corrosion problem….
> In the data provided, Blade was not able to find documentation with results of the proposed study or if the study was done or not.

With this information in mind, please answer:

a. Was the study mentioned in this passage done?
b. If so, please provide it.

RESPONSE 8:

SoCalGas objects to this request on the grounds that it assumes the accuracy of the applicable findings and conclusions in the Blade Report. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed to allow SoCalGas to respond to this request by Monday, November 18, 2019.

QUESTION 9:

For this next set of questions, please reference the Blade Report, page 2, which states in part,

> "The FF-34A well file mentioned a study of the possible external casing corrosion problems in the southeastern portion of the field, but Blade was not able to locate any documentation related to this study."

With this information in mind, please answer:

a. Was the study mentioned in this passage done?
b. If so, please provide it, including all documentation related to it.

RESPONSE 9:

SoCalGas objects to this question on the ground it is duplicative of Question 8 hereinabove. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed to allow SoCalGas to respond to this request by Monday, November 18, 2019.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

Pre-Formal Inquiry into California Gas Management, Practices and Procedures Related To The Aliso Canyon Incident in October, 2015.

EXAMINATION UNDER OATH OF FRANK SELGA

REPORTER'S TRANSCRIPT
San Francisco, California
August 1, 2018
Pages 1 - 203

Reported by: Karly Powers, CSR No. 13991
Jason Stacey, CSR No. 14092
Rebekah DeRosa, CSR No. 8708

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1 BE IT REMEMBERED THAT, by Subpoena, and
2 on Wednesday, August 1, commencing at the
3 hour of 10:02 a.m. thereof, at the offices of
4 the CALIFORNIA PUBLIC UTILITIES COMMISSION,
5 505 Van Ness Avenue, Room 4300,
6 San Francisco, California 94102, before KARLY
7 POWERS, CSR No. 13991, personally appeared
8 **FRANK SELGA,**
9 called as a witness herein, who, being first
10 duly sworn, was thereupon examined and
11 interrogated as hereinafter set forth.
12 * * * * *
13 MR. SHER: All right. On the record.
14 Good morning, Mr. Selga. I'm an
15 attorney representing the Safety and
16 Enforcement Division. And you are here today
17 to answer questions in the Examination Under
18 Oath. So I appreciate you being here.
19 EXAMINATION
20 BY MR. SHER:
21 Q
22 Q Do you mind stating your name and
23 address for the record?
24 A Frank Selga. 29404 Peregrine
25 Place, Tehachapi, California.
26 Q And Selga is S-e-l-g-a?
27 A That is correct.
28 Q Thank you.

1 Just some preamble beforehand, I
2 take it you've not done an Examination Under
3 Oath before?
4 A No.
5 Q Okay. I'll be asking you
6 questions, and you'll be responding under
7 oath. And we don't have a formal OII, Order
8 Instituting Investigation, this is a
9 preliminary fact-gathering endeavor. There's
10 no formal proceeding as of yet.
11 When I ask questions, it’s
12 important that you provide truthful answers,
13 complete answers. If you don't understand
14 anything, please let me know. If the accent
15 gets in the way, or whatever it is, I'll
16 repeat the question.
17 So I -- before we started, I handed
18 out subpoenas. Is that the subpoena you
19 received in order to be here today?
20 A I haven't received this in
21 particular.
22 Q Okay. So Counsel hadn't shown that
23 to you?
24 A No.
25 Q But you are here voluntarily and
26 under subpoena actually; correct?
27 A Oh, yes. Yes.
28 Q Okay. I've given the court

1 reporter a copy of the subpoena already too.
2 And the subpoena -- just to
3 clarify, the subpoena is a correct and
4 accurate copy of what we've provided you?
5 MS. CLORFEINE: Yes.
6 MR. SHER: Great. Thank you.
7 And, for the record, this is marked
8 as Exhibit 1.
9 (Exhibit No. 1 was marked for identification.)
10
11 MR. SHER: Q While I view this as sort
12 of a friendly conversation, you are required
13 by law to be here to answer these questions.
14 It is not voluntary in that sense.
15 A Okay.
16 Q When did you last work for Southern
17 California Gas Company?
18 A As an employee of Southern
19 California Gas Company?
20 Q As an employee; correct.
21 A I think it was November 1st of 2017
22 is when I ended my time at Southern
23 California Gas.
24 Q You clarified "as an employee."
25 Are you working for Southern
26 California Gas Company in a different
27 capacity subsequent to November 1, 2017?
28 A Yes.

1 Q Okay. In what capacity are you
2 currently working for Southern California Gas
3 Company?
4 A I'm a contractor.
5 Q And you've been contracted to do
6 what type of work?
7 A I think my title is Engineering
8 Project Manager. And I work for the Pipeline
9 Integrity Team.
10 Q Thank you. We'll come back to what
11 you currently do.
12 When did you first start working
13 for the gas company?
14 A It was March in 1981.
15 Q And what were your first roles?
16 A I started out as a meter reader.
17 Q And for how long were you a meter
18 reader?
19 A Approximately three years.
20 Q And then what position did you
21 take?
22 A After that, I became a field
23 service representative.
24 Q And for how many years?
25 A I can't recall.
26 Q Approximately?
27 A Oh, maybe three years, two years in
28 that position.

1 Q Okay. And then subsequent to the
2 field services, what did you do?
3 A I became an appliance service
4 representative.
5 Q And for how many years, if you
6 recall, were you an appliance service rep?
7 A Oh, my gosh. It was maybe -- I'm
8 only approximating, because I can't recall
9 dates. I would say about ten years, or so.
10 Q Okay. And then after that job,
11 what was your next position?
12 A I took a field service
13 representative job again.
14 Q What does a fields service rep do?
15 A Basically, it was the customer
16 service side of the gas company. So I
17 serviced and maintained our facilities from
18 the meter set assembly and then the
19 customer's appliances.
20 Q You would do home visits?
21 A Yes.
22 Q And then after your second stint
23 doing field service rep work, what did you
24 do?
25 A I became an appliance service
26 representative again.
27 Q Okay. And then after that job?
28 A I became a system protection

1 specialist.
2 Q And what is a system protection
3 specialist?
4 A That was a union, or represented,
5 job. And my job was to monitor, maintain,
6 and troubleshoot distribution cathodic
7 protection testimony systems.
8 Q And is there a difference between
9 working on the distribution system versus the
10 transmission system?
11 A Well, I could say this, they are
12 different operating organizations.
13 Q As far as the work that you would
14 do, would the work be different?
15 A The work had similar -- you know,
16 we're protecting pipelines with cathodic
17 production. So that's where they are
18 similar.
19 Q Okay. What would any differences
20 be between doing pipeline protection work on
21 the distribution side versus the transmission
22 side?
23 A Not a whole lot. They had
24 different dynamics, but there's essentially
25 no huge difference between the two.
26 Q Okay. And does one need a
27 specialized degree in order to do the system
28 protection to become a system specialist --

1 protection specialist side?
2 A No, sir.
3 Q No. What is your education
4 background?
5 A I've got a high school diploma, and
6 I have some college.
7 Q Okay.
8 A No degree.
9 Q Okay. After you were a system
10 protection specialist, did you take a
11 different job?
12 A Yes.
13 Q And what was that job?
14 A I took what was called, then, a "V
15 Assignment" as, I think it was called, a
16 project specialist in cathodic protection.
17 Q Can you tell me, what is a "V
18 Assignment"?
19 A A "V assignment" was essentially a
20 way to introduce a represented employee to
21 the management ranks and to get a feel and
22 for them to look at me and for me to look at
23 them.
24 Q And "V" as in the letter "V"; is
25 that right?
26 A Yes.
27 Q And that was just simply a
28 designation at the company?

1 A Yes, it was --
2 Q Okay.
3 A It was understood as a
4 non-permanent-like situation.
5 Q Okay. And did you take on any
6 different roles after that?
7 A Yes.
8 Q And if you don't mind describing
9 what those roles were?
10 A I became a project specialist, I
11 guess you could say, permanent.
12 Q And that would be a project
13 specialist in corrosion protection? Or what
14 was that in?
15 A In cathodic protection.
16 Q I guess now would be a good time to
17 -- if you could define, what do you mean by
18 "cathodic protection"?
19 A Cathodic protection is a discipline
20 that -- one part of corrosion control. So
21 cathodic protection is one of those parts of
22 corrosion control that I was specifically
23 concentrating on.
24 Q What would a day look like to you
25 -- I don't know whether it’s implementing
26 some sort of cathodic protection or whether
27 you're monitoring cathodic protection already
28 on the system? Could you just give me a

1 sense of what your day would look like?
2 A What time period are you --
3 Q You're a project specialist
4 permanent at this point.
5 A Okay. So my job, as it were at
6 that time, was to ensure that -- well, number
7 one, that we were complying with the company
8 policy and the existing regulations. And
9 then there was a training component. I would
10 train the field employees in cathodic
11 protection.
12 Q How many employees would you train?
13 Do you recall?
14 A I can't give you an exact number in
15 that role at that time. I probably had maybe
16 10 or 11 employees that I kind of overseen.
17 Q Okay. And for how long were you a
18 project specialist permanent?
19 A I can't really -- it was probably
20 about two, three years.
21 Q And the next position you had was?
22 A I became the system protection
23 supervisor.
24 Q And what kind of work were you
25 doing as a system protection supervisor?
26 A That work was varied in its scope.
27 It wasn't just cathodic protection. My job
28 included interfacing with the PUC during its

1 audits. It also included ensuring the
2 execution of compliance orders in addition to
3 cathodic protection.
4 Q Did you have any further roles
5 after that?
6 A After that position?
7 Q After that position.
8 A Yes.
9 Q And what were those roles?
10 A I became the technical specialist,
11 if I remember correctly, for storage.
12 Q So everything prior to the
13 technical specialist for storage, the work
14 you were doing in those roles, was that work
15 done on just the distribution system?
16 A Prior to the technical -- yes, yes.
17 And I want to define that, because
18 -- well, "distribution" meaning that that's
19 the operating organization. However, we did
20 provide cathodic protection on DOT-defined
21 transmission lines. So, you know, in other
22 words, distribution, we had DOT transmission
23 lines. But they are operated through the
24 distribution.
25 Q Okay. Understood.
26 What year was this about? Do you
27 recall? When you -- prior to taking the
28 technical specialist job for storage, are we

1 talking about 1990s?
2 A Let's see, I --
3 MR. DRAGNA: I'm sorry. The year
4 before he took this last job we're talking
5 about?
6 MR. SHER: Yes.
7 Q The technical specialist for
8 storage, when you transitioned to that job,
9 around what time did you transition?
10 A That was in, I want to say, May
11 2009.
12 Q You mentioned earlier that cathodic
13 protection is one part of corrosion control;
14 is that correct?
15 A Yes, sir.
16 Q What are other aspects of corrosion
17 control?
18 A Good question. So, corrosion
19 control can be defined either atmospheric,
20 internal, or external buried steel
21 structures. Okay?
22 So, your question was what again?
23 Q You said cathodic protection is
24 one, sort of, aspect of the corrosion
25 control.
26 A Right.
27 Q I just wanted to know what other
28 examples are of methods used to control

1 corrosion?
2 A Oh, okay. There are several
3 things.
4 Number one, corrosion control could
5 include cathodic protection. Typically,
6 includes coating, and there's a design aspect
7 to corrosion control. In other words,
8 sometimes you'll have something where the
9 only way to mitigate corrosion is to design
10 in a corrosion tolerance, as it were. So you
11 design it in.
12 Q What would an example be of a
13 corrosion tolerance? Let me rephrase that.
14 Could an example of corrosion
15 tolerance design be a thicker-walled pipe?
16 A It could be, yes.
17 Q Okay. So what other examples would
18 there be, if you have any?
19 A Well, a steel structure, even
20 aboveground, you can design into the
21 structure certain welds to keep water from
22 accumulating between joints. You can thicken
23 up a bridge, just give it more material. So
24 those are examples. You could even do that
25 with pipe.
26 Q Okay. And so the cathodic
27 protection and the coating and design, those
28 would be examples that apply to aboveground

1 facilities, aboveground distribution pipe?
2 A Are you -- are you saying just a
3 distribution pipe, or?
4 Q Well, for example, do you -- for
5 cathodic protection or corrosion control --
6 so for corrosion control, do you coat pipes
7 in the ground to a well?
8 A Oh, so we're talking about well?
9 Q No. I just want to know whether
10 you apply the same method to pipes that are
11 in storage fields as opposed to pipes that
12 are aboveground?
13 A I'm having a hard time
14 differentiating when you say "storage
15 fields." Because storage field has both
16 belowground and, what I would define as,
17 surface facilities, pipeline that are buried
18 but they are surfaced; right?
19 Q That's a good way to distinguish
20 it.
21 A Okay.
22 Q So are you applying coating to
23 belowground pipes to help prevent corrosion?
24 A I don't know. Coating a horizontal
25 pipe is relatively, very easy. Coating a
26 pipe that's drilled into the earth, that's
27 another thing.
28 Q And you wouldn't precoat a pipe and

1 drill it into the earth?
2 A I can't speak for what we do.
3 So --
4 Q In your experience, have you seen a
5 coated pipe being put into the ground?
6 A I do know that pipe -- drill pipe
7 that's used as a casing, for instance, may
8 have a lacquer finish when it comes out of
9 the factory.
10 Q And what would a lacquer finish do?
11 A Typically, it prevents, during
12 transport -- that it’s not exposed to the,
13 like, atmospheric-type corrosion. But it has
14 some value as it goes into the ground.
15 Q Okay. So, approximately, 2009 you
16 change roles, and now you are a technical
17 specialist for storage; is that correct?
18 A Yes, sir.
19 Q Okay. Between 2009 and
20 November 2017, what roles did you have?
21 A Well, I was the supervisor, or team
22 lead, for cathodic protection for storage.
23 Q Who would you have reported to?
24 A That would be the technical
25 services manager for storage.
26 Q And what would that person's name
27 be?
28 A Well, there were multiple during my

1 tenure there.
2 Q And the tenure being 2009 through
3 2017?
4 A Yes, so there were three, four.
5 Q And could you name those three to
6 four individuals?
7 A Yes. Lisa Quon.
8 THE REPORTER: Can you spell the last
9 name, please?
10 THE WITNESS: Q-u-o-n. I'm not sure if
11 there's two Ns. She'll slay me for that. I
12 think it's one N.
13 There was also Amy Kitson, A-m-y,
14 K-i-t-s-o-n. Let’s see. Firas Hamze,
15 F-i-r-a-s, H-a-m-z-e. And then Larry
16 Bittleston. I'm glad there's no really
17 strange names. Oh, Bittleston,
18 B-i-t-t-l-e-s-t-o-n.
19 MR. SHER: Q And, do you recall, was
20 Ms. Quon your first supervisor, and then Mr.
21 Bittleston the last supervisor? Or your last
22 direct report?
23 A Yes, I think that's fair. Yes.
24 Q Okay. And then as far as Ms.
25 Kitson goes, when was she in your direct
26 report?
27 A You know, I can't remember specific
28 dates.

1 Q Okay. But later on?
2 A She was after -- Amy was after Lisa
3 Quon.
4 Q Okay. And do you know if Ms. Quon
5 still works for Southern California Gas
6 Company?
7 A To my knowledge, last I heard, yes.
8 Q And Mr. Hamze?
9 A To my knowledge, same thing, yes.
10 Q And Mr. Bittleston?
11 A Yes.
12 Q Okay. Thank you.
13 With regards to corrosion control
14 at storage fields, understanding that you
15 have subsurface and surface facilities, and
16 based on your responses thus far, I believe
17 there is a difference between corrosion
18 protection for surface facilities versus
19 subsurface; is that correct?
20 A Well, I -- if I'm understanding
21 correctly, the principles of corrosion, they
22 are the same wherever. There's no
23 distinction. However, there's a strong
24 environmental -- how the structure interacts
25 with the environment.
26 So, like, a well case is entirely
27 different from a horizontal pipeline or a
28 tank that I might be protecting. It has --

1 they all have their different environments
2 and different interactions. But the
3 principles of corrosion still remain the
4 same.
5 Q What corrosion control techniques
6 are you using aboveground that you do not use
7 below ground?
8 MR. DRAGNA: Today?
9 MR. SHER: When he was working there.
10 MR. DRAGNA: During the last job?
11 MR. SHER: Just when he was working
12 there.
13 THE WITNESS: Could you state that
14 again?
15 MR. SHER: Q so, again, you've stated
16 that there's surface and subsurface
17 facilities at a storage field; correct?
18 A Yes.
19 Q And I'm trying to find out, do you
20 use different corrosion control practices on
21 the surface versus subsurface?
22 A I can say this, the principles are
23 the same. The application may differ
24 according to whatever the -- however the
25 facility I'm trying to protect, and its
26 environment. I don't know if that's a --
27 Q Are you using different techniques
28 to protect the below-surface pipe than you

1 are with the surface pipe?
2 A Well, I think a distinction that I
3 would like to make is that when I apply
4 cathodic protection, usually it doesn't end
5 with just applying cathodic protection.
6 There's a monitoring aspect to cathodic
7 protection as well. So the monitoring may
8 differ between, like, a horizontal pipe
9 versus a down hold pipe.
10 Q How do you monitor your cathodic
11 protection? Let’s start with surface
12 facilities.
13 A Okay. So typically, by code, we're
14 required to monitor if there is a rectifier.
15 We monitor the rectifier performance.
16 Q What is a rectifier?
17 A A rectifier turns alternating
18 current, it turns it into DC current. And DC
19 current is the technology by which we provide
20 cathodic protection.
21 Q Ah, so if the rectifier breaks,
22 you're not providing the appropriate cathodic
23 protection?
24 A Let's just say -- I mean, it
25 doesn't necessarily mean we're not providing
26 cathodic protection. That is a component of
27 it. So, in other words, if I had multiple
28 rectifiers on a pipeline and one of them

1 wasn't working correctly, I can use the other
2 rectifiers to support what that rectifier is
3 not doing. So it's not always true that, you
4 know, when a rectifier is not working that
5 your system is not bring protected.
6 Q Understood.
7 How do you determine whether a
8 rectifier is working? Is it a computer
9 signal? Or do you have to physically go out
10 and look at the pipe?
11 A You can -- well, a rectifier is
12 different from a pipe. Just staying on the
13 monitoring of the rectifier, we're required
14 by code to -- and as the code would say,
15 we're required to inspect the rectifier for
16 its operation if it's working.
17 Q And one does this on an annual
18 basis?
19 A We're required by code, as a
20 minimum, to do it six times a year; not to
21 exceed 75 days, if I can remember correctly.
22 Q Okay. Thank you.
23 What other types of corrosion
24 control, then, are you using on your
25 aboveground facilities at storage fields?
26 A We can use sacrificial anodes to
27 provide cathodic protection.
28 Q And what is a sacrificial anode?

1 A A sacrificial anode is a material
2 that's more -- let’s just say, without
3 getting too technical -- it’s a more active
4 metal that will corrode itself in favor of
5 protecting our pipe, or whatever it is that
6 we're protecting.
7 Q Okay. And feel free to get into
8 more details.
9 A Okay.
10 Q What are you -- with regard to
11 corrosion, what causes corrosion on
12 aboveground facilities?
13 A Do you want me to get in the actual
14 mechanism?
15 Q What causes it? So, like, is it
16 water? Wind?
17 A Any time you have a metallic
18 structure that's in an electrolyte -- well,
19 let me just say this, there are four things
20 necessary in order for something to corrode.
21 You need an anode, a cathode, a metallic
22 path, and an electrolyte. So if you put a
23 pipe or any other, for instance, mostly
24 steel, you put it in the ground, you have
25 these -- you have the electrical conductor,
26 which is the pipe itself, you have the soil
27 that it’s in, which is the electrolyte, and
28 then you have these small differences in

1 potentials on the steel structure, the
2 differences in potentials causes a current
3 movement. So you have about anode and
4 cathode on the pipe.]
5 Q With regards to below surface, what
6 causes corrosion, same as above ground?
7 MR. DRAGNA: You mean below surface
8 pipes, as opposed to wells, or both?
9 MR. SHER: Below surface, to me, is
10 down-well, but I'm -- there's the -- the
11 surface facilities, and there's the below
12 surface facilities.
13 MR. DRAGNA: Yeah. I need you to
14 define the surface facilities, including
15 buried --
16 MR. SHER: Q Okay. So, when I say,
17 "below surface," it's the well --
18 A Okay.
19 Q -- the piping and tubing.
20 A Okay. So -- well, there -- there's
21 more -- there's more that occurs on a
22 horizontal pipeline. It's -- I mean there
23 could be other corrosion mechanisms
24 occurring. Or let me just say this: There
25 could be like a -- there could be some
26 erosion, so that there's a distinction
27 between corrosion and -- and erosion. In
28 other words, if you got sand going through a

1 pipe, or even some water or even air bubbles,
2 that could create some corrosion issues.
3 Q And that would be -- so I'm
4 imagining you have pipe going down to a well,
5 and you're pulling liquid, whether it's gas
6 or oil, up through that, and you're saying
7 that particles in that material could also
8 cause corrosion on the inside, or erosion?
9 A Yeah. I mean that's not my area of
10 expertise. I'm a cathodic protector, as it
11 were. So what's going on internally, that's
12 not where my primary expertise is.
13 Q So is there a difference between a
14 corrosion control expert and a cathodic
15 protection expert?
16 A How do you quantify a corrosion
17 control expert?
18 Q But, that's what I'm trying --
19 that's what I'm trying to --
20 A Yeah.
21 Q So cathodic protection, seemingly,
22 is the outside the pipe?
23 A Yes, sir.
24 Q And so -- and -- and your role is
25 to -- in your job, how much time is spent on
26 internal erosion protection?
27 A Very little. That's not my area
28 of --

1 Q Is -- do you know, does anybody at
2 Southern California gas focus on the internal
3 potential for erosion of the pipe?
4 MR. DRAGNA: We're still talking about
5 wells?
6 MR. SHER: We are.
7 MR. DRAGNA: Okay.
8 THE WITNESS: I can't --
9 MS. CLORFEINE: Sorry. Is this 2009 to
10 2017, you're saying?
11 MR. SHER: (Nods.)
12 THE WITNESS: Could you restate that
13 question?
14 MR. SHER: Q Sure. I understand that
15 cathodic protection is your area of
16 expertise. Is that correct?
17 A Yes, sir.
18 Q And you've mentioned that there's a
19 potential for material in the pipe to cause
20 erosion of the metal. Is that correct?
21 A Yes, I know that that's possible.
22 Q Okay. And so does anybody, to your
23 knowledge, at Southern California Gas
24 Company, focus on preventing or protecting
25 against the erosion from the inside of the
26 pipe?
27 A I can say that I know that the --
28 the underground storage group -- I know they

1 look at that, and --
2 Q How would one look at that?
3 A At the -- on or about the wellhead
4 you can have erosion probes installed, and
5 they can get an idea of -- of what kind of
6 sand they're bringing up.
7 Q Where would this be documented, for
8 example?
9 A I have no idea. Well, no, I'm -- I
10 have some idea. All I know is some isolated
11 cases, though, where the underground storage
12 engineer at the field may maintain those
13 files.
14 Q Do you know where those files would
15 be kept?
16 A No, I don't.
17 Q Are they in a central repository?
18 A I -- I -- I don't really know.
19 Q Follow up -- a couple follow up
20 questions --
21 A Okay.
22 Q -- to see if it jogs your memory.
23 A Sure.
24 Q Would this kind of information be
25 kept in the well file?
26 A I -- I don't know how one would
27 define a well file, as such.
28 Q In your role -- in your job from

2009 to 2017 --

A Uh-huh.

Q -- did you ever have -- did you ever review well files?

A Specifically, I don't -- I don't know what the definition of a well file is. I have some ideas what it might be, but I -- I don't know what a well file is.

Q You're working a -- on a well --

A Sure.

Q -- down-well on a pipeline going in a -- vertically in the ground, and you're doing your cathodic protection. Can you explain what you would do to protect that pipe?

A You're talking about the well casing.

Q Well casing.

A So what I would do -- are you talking about the way I apply cathodic protection or --

Q The way you apply it, the way it's meant to work, and where do you document that work?

A Okay. So if -- if I put a well under cathodic protection, that work is usually -- from the testing to the design to the construction is all kept in -- that was

1 one of my files, and the monitoring of it was
2 kept in our recordkeeping system called
3 Maximo.
4 Q Can you spell that?
5 A M-a-x-i-m-o.
6 Q And does that stand for anything?
7 A No. It's just a common work
8 management system, record system.
9 Q And you were talking about
10 construction in your last answer.
11 Does -- were you envisioning a
12 brand-new well and applying cathodic
13 protection to a brand-new casing vertically
14 in the ground?
15 A Was I envisioning?
16 Q I heard the word "construction."
17 So were you talking about placing cathodic
18 protection on an existing casing in the
19 ground or brand-new well being constructed?
20 A There's no differentiation. If I
21 apply cathodic protection, I'll -- I'll -- I
22 will take it from the concept of, you know,
23 determining if we're going to do it or not,
24 and then I'll go through certain steps, from
25 design to the construction and completion of
26 the CP system.
27 Q Okay. So if you don't mind, just
28 walk me through an example of how you do

1 cathodic protection on a vertical pipe.
2 A Okay. Well, actually, we -- when I
3 came in to storage in 2009, there -- there
4 was existing systems out there, so it was
5 just maintaining them.
6 Q And just with regards to the
7 existing systems, are you talking just, in
8 general, or where specifically are you
9 talking? At Aliso Canyon, all of SoCalGas'
10 storage fields?
11 A We're talking down-hole?
12 Q Down-hole.
13 A It's wherever in storage, yes.
14 Q So you would -- in your role, from
15 2009 to 2017, you would work on just Aliso,
16 or would you work on all of Southern
17 California Gas' storage fields?
18 A I was responsible for all the
19 fields --
20 Q Okay.
21 A -- yes.
22 Q And as far as you know, SoCalGas
23 employs cathodic protection at all of its
24 fields?
25 A For down-hole?
26 Q For down-hole.
27 A No.
28 Q And which fields does it not use

1 cathodic protection on down-hole?
2 MR. DRAGNA: I'm sorry, Nicholas.
3 Every well or some wells?
4 MR. SHER: Fields.
5 MR. DRAGNA: Every well in each field?
6 MR. SHER: I'm not asking for every
7 well; just --
8 MR. DRAGNA: Whether there's a well --
9 MR. SHER: Whether there's cathodic
10 protection at a certain field, and then we
11 can go down.
12 MR. DRAGNA: Okay.
13 THE WITNESS: Okay. So there -- there
14 is cathodic protection applied to the well
15 casings at Goleta, Honor Rancho, and then
16 some at Aliso Canyon.
17 MR. SHER: Q And I -- I assume there's
18 a rationale for why those fields may have
19 some cathodic protection, and others may not.
20 What would that rationale be?
21 A I can't speak to the rationale. I
22 don't --
23 Q As an expert in cathodic
24 protection --
25 A Yes, sir.
26 Q -- why would you not have cathodic
27 protection at every gas storage field for
28 down-well facilities?

A Cathodic protection, just speaking in general terms, may or may not be effective on well casings.

Q In what instance would they not be effective?

A In some instances -- and the whole concept of -- of cathodic protection -- if you -- if you'll remember, I talked about the difference in potentials. I know I'm going more granular, but if you've got difference in potentials on a pipeline or structure, you're going to have current moving, current -- whenever that current leaves a steel structure, you have corrosion. When we apply cathodic protection, we're impressing DC current onto that structure through the electrolyte where it exists. So sometimes, if you -- like, for instance, a horizontal pipe, it's relatively easy to apply cathodic protection. Number one, it's -- it's easy, because it's on the surface. I mean it's very very easy. And you can monitor the performance of it.

Down-hole, it's entirely different. There's -- there's -- sometimes your cathodic protection, when you're introducing or impressing this DC current into the soil, some of it may stray from its original

1 target, in this case, maybe a well casing.
2 And the nature of DC current, it -- when it
3 goes out, it must return. So if there's a --
4 another foreign facility, you may be causing
5 some detrimental interference on it.
6 Q Wells go down as deep as 8000 feet.
7 Is that correct?
8 A And possibly more, yes.
9 Q Okay.
10 A Yes.
11 Q How far down-well can one apply
12 cathodic protection, feet-wise?
13 A That is a really -- that can
14 differ, according to the environment,
15 according to the well pipe itself. It --
16 it -- it differs from site to site, well to
17 well.
18 Q What is the general range with
19 regards to Goleta, Honor Rancho and Aliso?
20 Do you have a -- is it 900 feet, average,
21 500 feet, 5000 feet?
22 A I can't really speak to -- speak to
23 the effectiveness of it.
24 Q All right. Let's focus on Aliso
25 Canyon.
26 A Okay.
27 Q How much cathodic protection does
28 SoCalGas have on down-well casing?

1 MR. DRAGNA: During that time period?
2 MR. SHER: 2009 to 2017.
3 THE WITNESS: At Aliso Canyon?
4 MR. SHER: Q Yeah. To your -- to your
5 recollection, how many wells have cathodic
6 protection?
7 A At that time -- see, it was kind of
8 dynamic, because there are -- they're always
9 shutting wells -- or they're doing well work
10 on them. So the CP may be turned off for a
11 time while they're doing well work. So let
12 me just say there's approximately five, five
13 well casings at Aliso.
14 Q How did you, your team or SoCalGas,
15 in general, determine that those five wells
16 needed cathodic protection?
17 A I can't speak to prior to my time;
18 so I can't speak to that.
19 Q So, but, from 2009 to 2017, five
20 wells have cathodic --
21 A Uh-huh.
22 Q -- protection. Why were those
23 wells chosen to be protected that way?
24 A I can't speak to the ones that were
25 previously under cathodic protection, but I
26 can say that I was given approval to put
27 cathodic protection on two well casings.
28 Q And do you recall the time period?

A I -- I want to say -- and I have no -- I have no record of this anywhere.

Q I would rather you didn't guess.

A Yeah.

Q I'm assuming that you kept records --

A Yes.

Q -- in your role as a cathodic protection specialist at SoCalGas.

A Yes.

Q Okay. Where would those records be, what would those records be called?

A The monitoring records are -- are captured in -- or maintained in Maximo. So, in other words, a rectifier that provides that protective current, those will be in Maximo.

Q Why did you decide to seek authority to put cathodic protection on those two wells?

A Why did I? I just -- I asked -- during that time, I knew these two new wells were constructed, and I asked "Do you -- would you like for me to put them under cathodic protection?"

Q And the answer was?

A "Yes."

Q Did you or your team do any

1 analysis as to these specific wells with
2 regards to cathodic protection?
3 A Analysis before or after, during,
4 or --
5 Q I'm making assumption --
6 A Yeah.
7 Q -- that you don't just pick wells
8 randomly to apply cathodic protection to.
9 Correct?
10 A Uh-huh. That's correct. Yes.
11 Q So what sort of analysis do you do
12 in order to determine which wells need
13 cathodic protection?
14 A I personally didn't do any
15 analysis.
16 Q So, but, someone did?
17 A I -- that's an assumption. But, I
18 can't, you know -- I made an offer, and they
19 said, "Yes, do it." I mean, you know, I
20 can't tell you the process they had or --
21 Q And -- and so, who would they be?
22 What's the group called?
23 A It's -- really, too, is the
24 underground storage group and the field
25 manager.
26 Q And -- and today, you don't know
27 why they said, "Yes" to providing cathodic
28 protection to those two wells?

1 A I -- I can't speculate on what
2 their rationale -- no, I -- I can't.
3 Q And so the three wells -- sorry.
4 You mentioned five wells?
5 A Yes.
6 Q So the -- those two wells you've
7 mentioned, the cathodic protection was
8 applied during 2009 to 2017. Is that
9 correct?
10 A No. It -- oh, when I initiated the
11 cathodic protection on those two wells?
12 Q Yes.
13 A If I remember, you know -- and
14 don't hold me, but it was -- I want to say
15 2013, maybe 2014, when I did that.
16 Q And do you recall the wells --
17 A Yes.
18 Q -- the names?
19 A Yes, I do.
20 Q And they are?
21 A Porter 50, B and C.
22 Q The three wells that you did not
23 apply cathodic protection to, but someone
24 prior to you did, do you know which wells
25 those were?
26 A I want to say they're Fernando
27 field -- I want to say, "34," but --
28 Q Where --

A -- it's been sometime. I'm sorry. I just don't remember.

Q Understood. Where would I find that information?

A I -- I remember, during the time, we provided that information to you on various data requests, because I got them from everyone.

Q Okay.

A But, right now, you could probably just -- I don't know who they'd ask. I mean we can ask someone from the --

Q You don't know specifically where that information is kept at SoCalGas?

A It -- it -- you could probably find that in Maximo.

Q Okay.

A Yes.

Q Prior to 2009, was someone else in -- in your position that you took?

A Yes. Yes.

Q Okay. And who was that person?

A John Orona, O-r-o-n-a.

Q And would Mr. Orona know who applied cathodic protection to those three wells?

A I don't know. I can't speak to what he knew.

1 Q Do you -- and I apologize if I
2 asked this.
3 A Yeah.
4 Q Do you know when those three wells
5 received cathodic protection?
6 A I can't specifically recall when
7 they were. I -- it -- it -- I don't want to,
8 you know, go on record saying it was this
9 year. I don't --
10 Q That's totally fine. I'd rather
11 you don't --
12 A Yeah.
13 Q Don't guess.
14 A Yeah.
15 Q With regards to maintenance of the
16 cathodic protection, did you or your team do
17 maintenance on those three wells?
18 A Yes.
19 Q And that would have been 2009 to
20 2017?
21 A Those wells were in place during --
22 or the CPU was in place during that period of
23 time.
24 Q And you monitored and maintained
25 that CP system?
26 A No, not -- the -- the monitoring
27 of -- which wells are we talking?
28 Q The three wells that --

A Okay. Okay. When I did a record search, I found we were monitoring the rectifier outputs.

Q What is a rectifier output?

A The rectifier outputs are -- typically, you're looking at volts and amps, what -- what is -- what is that rectifier putting out, the output.

Q How do you tell if the rectifier's putting out volts or amps?

A Well, one can physically visit the site, and make a connection with a multimeter. You can check or look at the gauges. The gauges aren't altogether accurate. They're analog, and they get -- so -- or we can do it remotely, through using remote monitoring units --

Q Do you --

A -- to monitor.

Q -- know how many rectifiers each of these three wells would have?

A For those three particular wells, there was one rectifier.

Q And where would the rectifier be placed on each well?

A The -- well, there's a -- there's different components in the cathodic protection system. The rectifier is only one

1 of those components. This one was on or
2 about the -- one of the pads. I don't
3 remember the well. We had a rectifier
4 location.
5 Q So the rectifier was not below
6 ground. It was on the surface?
7 A Yes. Yes, it's above ground.
8 Q It's above ground?
9 A Yes. Yes.
10 Q Okay. Did you have any below
11 surface cathodic protection on those wells?
12 A Below surface?
13 Q I'm -- I'm a lawyer.
14 A Oh, okay. Okay. Yeah.
15 Q I may ask you questions that make
16 no sense to you.
17 A Okay. Fair enough.
18 Q So you can correct me.
19 A Yeah.
20 Q I make an assumption that one
21 applies cathodic protection as much as
22 possible on a -- on a down-well facility. Is
23 that not correct?
24 A As much as possible?
25 Q See, this is what happens when you
26 get a lawyer asking you questions about --
27 MR. BRUNO: Let me -- let me ask
28 questions about that.

1 MR. SHER: Do you want to ask questions
2 on that?
3 MR. BRUNO: Yeah, let me ask the
4 questions.
5 THE WITNESS: Could you make that a
6 little more -- because I'm having a hard time
7 understanding what the question was.
8 MR. SHER: Q Mr. Bruno --
9 A Okay.
10 Q -- who has a better understanding
11 with regards to the question --
12 A Okay. Sure.
13 Q -- will ask you questions on that.
14 Okay. So we -- we have five wells
15 at Aliso that have cathodic protection. Is
16 that correct?
17 A That's correct.
18 Q How many wells at Goleta have
19 cathodic protection?
20 A I don't remember the amount of
21 wells there. I just don't remember.
22 Q Why were cathodic protection being
23 used at Goleta?
24 A Well, number one, I inherited that,
25 so I'm maintaining that. You said why
26 would -- so --
27 Q Does Goleta offer something
28 different geologically or soil-wise versus

1 Aliso Canyon?
2 A Well, I can say, just in general
3 terms, there's a -- yes, the location is
4 entirely different. I know the zone is much
5 shallower in Goleta versus in Aliso Canyon.
6 I think, going by memory, I want to say,
7 Goleta wells, there may be 4000, 5000 feet.
8 So Aliso can be double that, easy.
9 Q And so why would that difference
10 impact how one applies cathodic protection to
11 the different fields, or the wells in the
12 fields?
13 A Well, I think it's fair to say --
14 remember when I say what we're doing in
15 cathodic protection; we're impressing DC
16 current into the soil and onto the structure.
17 The soil itself is a huge resister, as it
18 were. Even though it's an -- an electrolyte,
19 it has some conductivity; but, in relative
20 terms, it's -- it's pretty resistive. So --
21 and this is same as it's true with horizontal
22 pipe. If I'm trying to impress current
23 through the soil to the structure I'm
24 protecting, it will attenuate or -- in other
25 words, it -- the current is going to have an
26 easier time going to a location that's a
27 hundred feet away versus two miles away.
28 Q Understood.

A And it's -- it's the resistivity of the -- the environment that it's in; same is true with well casings.

Q Okay. Does SoCalGas have a corrosion control program or a cathodic protection program?

MR. DRAGNA: As to time?

MR. SHER: Just doesn't matter.

MR. DRAGNA: Well, it matters to -- based on what you're talking about, what program; so as long he specifies what he's talking about, just so the record's clear.

MR. SHER: Q Today --

A Yes, sir.

Q -- does SoCalGas have a corrosion control program?

A Well, yes.

Q Does -- today, does SoCalGas have a cathodic protection program?

A Well, I -- I'm -- maybe I'm struggling with the definition of program. We have gas standards in place right now that determine, I guess -- I don't know if you want to define it as a program. But --

Q Those gas standards, are those internal to SoCalGas, are those applied -- required to be complied with by the government?

1 A With most pipeline regulation
2 mandated issues, our Gas Company standards
3 will meet or exceed what the regulations are.
4 So I don't know if I answered that.
5 Q But, with regards to the wells and
6 down-well at storage fields, the standards
7 that you use with regards to corrosion
8 control, are those SoCalGas standards?
9 A No. No.
10 Q Where were those standards coming
11 from?
12 A You're talking down-hole?
13 Q Down-hole.
14 A When you say, "standards," can you
15 help me to --
16 Q I think you mentioned standards,
17 that SoCalGas has its standards, and you're
18 saying -- you've said that SoCalGas'
19 standards meet or exceed -- I'll use the word
20 code sections.
21 A Right. Right. Right.
22 Q And so I'm just trying to figure
23 out, for down-well -- let me ask it this way.
24 A Okay.
25 Q What government code, whether state
26 or federal, apply to SoCalGas' down-well
27 facilities with regards to corrosion control
28 and cathodic protection?

1 A I can speak to cathodic protection.
2 There are no state or federal code that
3 mandates cathodic protection on well casings.
4 Q Okay. Then, I'm assuming, with
5 regards to cathodic protection, the standards
6 that you and your team use are internal to
7 SoCalGas. Is that correct?
8 A In respect to --
9 Q How --
10 A -- well casings or --
11 Q Well, well casings, whatever you
12 need to apply cathodic protection to, to
13 protect your down-well facilities.
14 A We have no Gas Company standards
15 that deal with down-hole.
16 Q Do you have any best management
17 practices?
18 A I mean there's nothing in our
19 company policy that -- for -- in regards to
20 cathodic protection to well casings. There
21 are none.
22 Q You've mentioned training earlier.
23 A Uh-huh.
24 Q Have you trained people in cathodic
25 protection?
26 A Yes, sir.
27 Q What do you -- are you using --
28 what -- what standards are you using to teach

1 people how to apply cathodic protection
2 correctly, et cetera?
3 A Well, obviously, we'll have our
4 internal training; so people that come
5 through the system, they're being taught and
6 trained through our formalized system. In
7 addition to that, we have our company gas
8 standards. And then, from a technical
9 resource, we have the -- NACE standards.
10 Q Could you define that for me?
11 A NACE or the company --
12 Q NACE.
13 A Okay.
14 Q Is it N-A-S-E?
15 A N-A-C-E.
16 Q And it stands for?
17 A National Association of Corrosion
18 Engineers. Now it's defined as
19 international, because they're -- they used
20 to be America-centric. Now it's
21 international.
22 MR. DRAGNA: Nicholas, could -- can we
23 take a bathroom break?
24 MR. SHER: Yes.
25 MR. DRAGNA: It's been an hour or so.
26 MR. SHER: Off the record.
27 (Recess.)]
28 MR. SHER: Mr. Bruno has some questions

1 for Mr. Selga.
2 EXAMINATION
3 BY MR. BRUNO:
4 Q Thank you. Mr. Selga, I'm Ken
5 Bruno. I'm the program manager of the Safety
6 and Enforcement Division at the California
7 Public Utilities Commission.
8 A Okay.
9 Q I just want ask a few questions
10 here going back to your training and/or
11 certifications in corrosion. First of all,
12 would you consider yourself a corrosion
13 expert?
14 A Well, I suppose that's a relative
15 term. But, yes. Yes.
16 Q For purposes of the gas company,
17 SoCalGas, would you consider yourself the
18 corrosion subject matter expert?
19 MR. DRAGNA: You're talking CP or
20 corrosion in general?
21 MR. BRUNO: I'm talking about corrosion
22 subject matter expert.
23 MR. DRAGNA: Just in general.
24 THE WITNESS: Corrosion has many
25 different aspects. The question's -- it's
26 too broad for me.
27 MR. BRUNO: Q Sure. I understand.
28 A I don't want to say, you know, I'm

1 the definitive corrosion expert. Certain
2 people have certain disciplines in corrosion
3 control.
4 Q But you would -- you're one of them
5 with the discipline in corrosion control?
6 A I think that's fair enough.
7 Q Understood. Thank you, sir.
8 Could you briefly describe any
9 formal training you have in corrosion,
10 cathodic protection generally, or
11 certifications?
12 A Sure. Well, I've got a significant
13 19, 20 years in doing actual -- from hands-on
14 corrosion control to -- and managing it for
15 19, 20 years. So in practice, that. The
16 company training, I maintain and hold NACE
17 certifications. If you want me to list them,
18 I can.
19 Q Yeah. Just if you could. Whatever
20 certifications you have completed and are
21 certified as. That would be helpful. Thank
22 you.
23 A Okay. I'm certified as a corrosion
24 technician, a senior corrosion technologist,
25 cathodic protection 1, cathodic protection 2,
26 internal corrosion technologist, and coating
27 inspector Number 1.
28 Q Yes, sir. Thank you. So would you

1 consider yourself more of an expert on
2 mitigating corrosion or determining if
3 corrosion exists? Or both?
4 A Can you ask again?
5 Q Sure. Your job at SoCalGas
6 specifically as system protection specialist,
7 are you determining where corrosion exists?
8 A No. I'm determining if cathodic
9 protection is being applied correctly or not
10 as a system protection specialist.
11 Q So you do not assess whether or not
12 the threat of corrosion is present somewhere?
13 A No, not specifically. I assess the
14 performance of the cathodic protection
15 system.
16 Q And earlier when Mr. Sher was
17 asking you questions, you were referring to
18 two wells, and you said you made an offer?
19 A Yes.
20 Q Why did you make an offer to
21 protect those two wells?
22 A I had a -- why did I offer? I've
23 always made that offer.
24 Q Which offer?
25 A I -- with the existing facilities
26 that already had cathodic protection, it was
27 implied that I'm going to keep maintaining
28 the cathodic protection of those well

1 casings. And in the case of Aliso, I made
2 offers to provide cathodic protection to the
3 well casings there.
4 Q Of all the well casings?
5 A Well, in a general term. And I can
6 say generally, yes, for Aliso Canyon. And
7 specifically to Porter 50-B and C.
8 Q And why would you want to make that
9 offer for all those wells at Aliso Canyon?
10 A I look at my role as a contributor
11 for cathodic protection. So, you know, when
12 I ask, "Would you like to have these wells
13 under cathodic protection?" I would ask the
14 underground storage group and the field
15 manager if that's what they wanted me to do.
16 And then if they said yes, then I would do
17 it.
18 Q And is it correct that I understood
19 those two wells at Aliso Canyon where the
20 offer was accepted to put cathodic
21 protection, do I understand those were new
22 wells?
23 A They were new wells, yes.
24 Q Did you ever offer to put cathodic
25 protection on old wells?
26 A At Aliso Canyon?
27 Q At Aliso Canyon.
28 A Yes.

1 Q And what was the outcome of your
2 offer?
3 A They said, "No."
4 Q And who is "they"?
5 A Jim Mansdorfer.
6 Q Jim Mansdorfer, okay. Did he give
7 an explanation why?
8 A On one occasion, yes. He gave an
9 answer, yes. His rationale --
10 Q And what was that rationale from
11 Mr. Mansdorfer?
12 A Well, understanding that I don't
13 know all of his rationale, all I can say is
14 what he told me.
15 Q Yes, sir.
16 A Okay. So he told me there was a
17 lack of O2 in the reservoir. Or not so much
18 a reservoir but where the well casing was.
19 Q 02 being oxygen?
20 A Yes, sir.
21 Q Did that make sense to you?
22 A I understand -- not entirely. So,
23 I mean, I wasn't completely satisfied with
24 that. However, Jim was and is the expert on
25 what the integrity of that well casing. I am
26 not. I'm a cathodic protector.
27 Q Sure. Thank you, Mr. Selga.
28 A Yes.

1 Q So earlier you stated that as far
2 as you knew, there was no state or federal
3 codes that required cathodic protection
4 down-hole?
5 A That's correct.
6 Q Do you know why SoCalGas decided to
7 protect down-hole wells?
8 MR. DRAGNA: You mean about the five
9 instances? You're talking about Aliso?
10 MR. BRUNO: Let's talk about Aliso.
11 Q My understanding is no
12 requirements, yet, you inherited some and
13 went forward with two additional, why?
14 A Why what?
15 Q Why did SoCalGas protect five
16 down-hole wells at Aliso Canyon when they
17 weren't required to do so?
18 MR. DRAGNA: You mean install CP in the
19 pipelines? You said protect.
20 MR. BRUNO: Q Yes. In this instance
21 protect and install CP is one in the same?
22 A Yeah. I make a differentiation
23 when we -- I don't want to parse words. I
24 just want to make sure I'm clear. Is that
25 cathodic protection is only one means to
26 address any corrosion concerns.
27 Q Understood. I was answering the
28 question from your counsel. In the context I

1 was using it, I was referring to one in the
2 same.
3 In other words, do you know why the
4 five wells at Aliso Canyon were -- why
5 cathodic protection was installed on them
6 i.e. protected?
7 A I can say for the Porter 50-B and C
8 where I have a direct knowledge, I asked the
9 principals, the field manager and the
10 underground storage manger, "Would you like
11 me to protect the well casings? Because I
12 noticed there are new wells."
13 And they got together and said,
14 "Yes."
15 The three other wells in the other
16 field, there was a -- there was a study done
17 on those on at least one of those well
18 casings, and it suggested at that time to
19 provide cathodic protection for it.
20 Q Yes, sir. Do you recall who did
21 that study?
22 A Well, I think -- I mean, it's --
23 the study was done by an outside vendor. I
24 want to say it was Schlumberger.
25 Q And is there -- do you know if
26 there's a report or some sort of document of
27 that study?
28 A When you say a study, all I

1 remember is this: Is there was a what was
2 known -- or as known as a Cathodic Protection
3 Evaluation Tool that was employed for one of
4 the well sites out there. The group of three
5 wells.
6 Q Okay. So if I understand
7 correctly, there was some sort of study that
8 prompted the installation of the original
9 three wells at Aliso that you inherited?
10 A Yes.
11 Q Okay. Mr. Selga, I want to talk
12 about maintenance now. You described your
13 role as also maintaining systems?
14 A Mh-hm.
15 Q So at Aliso Canyon, can you talk
16 about what you did to maintain these three
17 wells under cathodic protection?
18 A You're talking about the FF wells?
19 Q Yes, sir. The five wells under
20 cathodic protection at Aliso Canyon. So just
21 if you can, kind of, describe how you
22 maintain those?
23 A Okay. So generally I'm just
24 talking in general terms, and it would apply
25 to well casings. I'm not -- I'm sorry. I'm
26 still chewing on a candy.
27 I'll apply the cathodic protection,
28 and then I'll monitor the performance through

1 the -- just monitoring the output of the
2 rectifier.
3 So in other words, we determine how
4 much current is needed to protect the well
5 casings. And then I want to ensure that I'm
6 maintaining that same current level, and so
7 that's what I say by "monitoring."
8 Q So anything -- so you look at the
9 output of the rectifier, but do you measure
10 the current on the down-hole portion of the
11 pipe?
12 A Not in all cases. Like, what I
13 employed at Porter 50-B and C, I determined
14 that the two well casings needed a certain
15 range. And that range -- don't, you know,
16 hold me on record. But I think it was
17 anywhere between four and six amps for well
18 casing.
19 Q How did you make that
20 determination?
21 A That's the determination on the
22 amount of CP current was done through a
23 testing technique called a E-LOG I.
24 Q E-LOG I?
25 A Yes, sir. E-LOG I. It stands for:
26 -- "E" stands for volts, and there's a --
27 it's done on a semi-log paper. And you log
28 the volts and the amps on a semi-log paper.

1 Q And, Mr. Selga, by E-LOG I, are you
2 referring to Appendix D of part 192 49 CFR?
3 A I'd have to see the code to, you
4 know, to say if that's where it is. I don't
5 recall it being in 192. It could be. I just
6 --
7 Q Okay. Fair enough. Do you recall
8 it being in any code or standard? The E-LOG
9 I for reference?
10 A E-LOG I is mentioned in the NACE
11 Standard Practice 0186.
12 Q Okay.
13 A And it provides guidance. So if
14 you put a well under, it gives you certain
15 tools to determine how much cathodic
16 protection current is required.
17 Q And if I understand correctly then,
18 there is no testing of the down-hole
19 components? The measuring current on the
20 down-hole portion of the pipe?
21 MS. CLORFEINE: With respect to those
22 wells?
23 MR. BRUNO: Q With respect to those
24 wells, yes.
25 A Can you help me out a little bit?
26 I'm trying to understand.
27 Q Sure. Absolutely. At any time at
28 Aliso Canyon, did you measure the current on

1 the down-hole pipe that was under cathodic
2 protection?
3 A For Porter 50-B and C, I can say
4 yes.
5 Q And how did you measure that?
6 A I know that the rectifier is
7 putting out "X" amount of current, and -- are
8 you saying from a design how I came to that?
9 Q No. I'm asking maintenance.
10 A I just monitor the rectifier. And
11 if the rectifier is putting out whatever the
12 value was, then it's -- then I knew that the
13 well casings were getting the current that
14 they needed.
15 Q Are you familiar with IR Drop?
16 A Yes.
17 Q How would you consider IR Drop in
18 the case of Aliso Canyon with the rectifier
19 that you just described?
20 A I mean, that's a big -- that's a
21 huge -- when we're talking about IR Drop,
22 that's a big item. So what do you
23 specifically want to know? IR for those two
24 wells?
25 Q Yeah. Really, what I want to know
26 -- my understanding is you're measuring the
27 output of the rectifier. You're not
28 monitoring the actual metallic structure.

1 You're assuming that the output is going onto
2 the metallic structure. I'm asking if you're
3 consider IR Drop in that equation?
4 A No. Only in the analysis of
5 determining if -- or how much current is
6 required to supply current to that well
7 casing. E-LOG I is only a determination on
8 how much current is needed to protect the
9 well casing.
10 Q I see. So under E-LOG I, you don't
11 have to really measure your metallic
12 structure?
13 A Well, when we do an E-LOG I, you're
14 taking potentials from -- in respect with
15 your reference electrode in respect to the
16 well casing that we're looking at. And
17 usually -- I don't know how much into the
18 weeds you want to know.
19 But we'll put a reference electrode
20 -- half cell, right, and a multimeter. We'll
21 put it remote, and we'll apply DC current to
22 the well casing.
23 And in the case of this well, I
24 don't remember the specifics. But usually
25 it's like in half hour increments. I'll
26 increase the current half an amp each time,
27 and then I'll record a read, a potential.
28 And then I'll keep -- and then I log that on

1 the semi-log paper.
2 Q Okay. So you're half cell?
3 A Yes, sir.
4 Q What is it connected to?
5 A It's connected to a multimeter via
6 a connector, a wire.
7 Q And what lead is connected to that
8 multimeter?
9 A The negative lead goes to the
10 reference electrode, and the positive lead
11 will go to the structure where the CP current
12 is intended.
13 Q Okay. And you don't consider that
14 reading the metallic structure?
15 A Yes, yeah.
16 Q Okay. So I consider that a little
17 more than measuring the output of the
18 rectifier.
19 A Okay. Let's -- okay. Maybe I'm
20 not painting the correct picture. So when we
21 take the potential on a well casing in, like,
22 Porter 50-B and C, we only take that
23 potential during that time of the test.
24 So we use -- when I take that
25 potential going through the process of E-LOG
26 I, the only thing that does, it provides --
27 the only value it provides me is that --
28 well, it provides some secondary information.

1 But the principal reason for that is only to
2 determine how much DC current is needed to
3 protect the well casing. That's all it is.
4 Q So if I understand you correctly,
5 are you referring to the time period before
6 the -- during the design? You're saying you
7 take a read off the native potential of the
8 pipe?
9 A I'll take a native read, and I'll
10 introduce, like, a half amp of current. And
11 then after a half an hour, I'll record that
12 read and plot it on a semi-log scale. And
13 then I'll go another half an hour, and I'll
14 increase the increment.
15 I don't know the values, and I
16 don't know the time. I just know that's what
17 I -- generally what I do. I don't know what
18 we did at the time.
19 Q I appreciate that. It's very
20 helpful. Did you ever -- once you get to
21 your established goal, if you will, as high
22 as you want to go for that protected metallic
23 structure, do you interrupt the current to
24 determine how much is actually getting on the
25 pipe?
26 A Okay. So with -- and I'm an
27 instructor for NACE, so forgive me if I get a
28 little more into the weeds.

1 Q Please do so.
2 A So when we -- I think you're trying
3 to get to IR Drop and the significance of it.
4 Am I correct in that?
5 Q No. What I'm asking you is: You
6 just described the process where you measure
7 native potential on a pipe.
8 A Yes.
9 Q And you increase the rectifier
10 until it gets to some level. I'm going to
11 call that polarized potential.
12 A Okay.
13 Q Do you ever interrupt and look at
14 the off readings? So yes --
15 A Yeah. During the test while I'm
16 conducting the E-LOG I, I'll get an on-read
17 and an off-read. The off-read being by pure
18 definition, it would be polarized potential.
19 But keep in mind that when we
20 monitor horizontal pipeline, it's an entirely
21 different world. And the reason is: I can
22 evaluate -- and any of you with just even
23 cursory training can determine a level of
24 effectiveness on a horizontal pipeline. You
25 know, five feet down or whatever it is. I
26 can tell you with a reference electrode if
27 it's meeting the criteria that's been
28 established.

1 So if I put a reference electrode
2 above the ground, it's looking at 180 degrees
3 or whatever -- it's looking at that portion
4 of pipe right there.
5 Q Right.
6 A So it's a representation of
7 multiple things occurring at that pipeline
8 right there. With a well casing, it's
9 entirely different. You got anywhere from 4
10 to 10,000 feet, and you got a reference
11 electrode over here, and it's looking at that
12 entire piece of pipe that's in the ground.
13 So you're looking at an average, as
14 it were, of the measurement that you're
15 taking, the polarized potential of that
16 entire column as it were.]
17 Q And what target were you looking
18 for when you look at your potential? What
19 were you trying to achieve?
20 A Really, what I'm trying to achieve
21 when I conduct an E-LOG I, I'm looking for --
22 as I'm plotting these reads on a semi-log
23 paper, those reads, they will be linear for a
24 while, and then they will make a turn. And
25 then once the two -- you will actually see
26 this line, and it depends on how you set it,
27 it will make it go up.
28 But at any rate, when you see that

1 turn, you make a determination as to, "oh,
2 polarization has begun on whatever this
3 structure is that I'm testing."
4 Q Okay.
5 A And, again, that only tells you how
6 much current is required to protect it. It
7 suggests that that's where polarization is
8 occurring.
9 Q Okay. Yes, sir.
10 With respect to, I believe it’s the
11 two wells that you protected at Aliso Porter
12 50B and C --
13 MR. DRAGNA: By that, you mean you
14 installed CP?
15 MR. BRUNO: Yes, sir.
16 Q So on those two wells where you
17 installed cathodic protection at Aliso
18 Canyon, how far down-hole were those well
19 cases?
20 A I don't know the exact -- it would
21 be just a guess, that's all it would be. And
22 that would be as good as knowing which
23 numbers to pick for lottery; right?
24 Q Did you monitor the effectiveness
25 over time on those two wells at Aliso Canyon?
26 MR. DRAGNA: Effectiveness of the CP?
27 Sorry, Ken.
28 (Reporter clarification.)

1 THE WITNESS: Can you say that again?
2 MR. BRUNO: Yeah.
3 Q I'm just asking, Mr. Selga, like on
4 the Porter 50B and C wells where you
5 installed cathodic protection at Aliso
6 Canyon --
7 A Yeah.
8 Q Like, if you could describe how you
9 monitored those after construction and over
10 time?
11 A How I monitored the cathodic
12 protection?
13 Q Yes.
14 A Correct?
15 Okay. So I monitored just by
16 virtue of the fact by looking at how much
17 current was being produced on those wells.
18 Q On the rectifier?
19 A Yes.
20 Q Okay. So you go up to the
21 rectifier, do you use a shunt? I mean, can
22 you describe how you get from your volts to
23 your amps?
24 A There's -- I think I installed
25 remote monitoring on that rectifier, so I
26 could tell by that what the output was. Or
27 one can go up to the shunt and connect to the
28 shunt and make a determination of how much

current was being applied.

Q Okay. And the remote monitoring, how does that work?

A It’s commonly used in the industry. It will tell me -- I can poll it at any point and say what are the outputs, what's the volts and amps of the particular unit, and if it’s working.

Q Okay. I think that's all I have right now, Mr. Selga. Thank you for very much.

A You bet.

MR. DRAGNA: Can we go off the record for a second?

MR. BRUNO: Off the record.

(Off the record.)

MR. GRUEN: Back on the record.

Mr. Selga, my name is Darryl Gruen. I'm also Counsel for Safety and Enforcement Division.

THE WITNESS: Okay.

MR. GRUEN: Thank you for being here today, even though you were required to be. We appreciate you being here.

THE WITNESS: Well, no one told me I was required. But I figured I ought to.

MR. GRUEN: Very good.

1 EXAMINATION
2 BY MR. GRUEN:
3 Q
4 Q A couple of questions, just
5 following up on your expertise, just -- I
6 wanted to clarify, maybe, one thing I had
7 understood earlier you to talk about. And
8 please correct me if I misunderstood.
9 You talked about internal erosion,
10 if I had understood correctly, where there
11 was a substance that might be responsible for
12 erosion inside a well casing, for example.
13 Did I understand that correctly?
14 A Yeah. But I'm not an expert in
15 that.
16 Q I get that. And I'm going right
17 there. So I get that you're -- and I heard
18 you very clearly say you're not an expert
19 there.
20 A Yes, right.
21 Q So I wanted to clarify, because I
22 see -- I think one of the things that you
23 identified was you're an internal corrosion
24 technologist.
25 Did I get that right?
26 A I'm certified as an internal
27 corrosion technologist.
28 Q Okay. So can you explain the

1 difference, for purposes of us understanding
2 your expertise, where your expertise extends
3 in terms of internal corrosion and where it
4 ends with regards to internal erosion?
5 A Principally -- because if you
6 looking at the course guidelines and the NACE
7 courses and the subsequent certification, it
8 indicates that the course is in internal
9 corrosion, basic and advanced, for pipelines.
10 So it’s pipeline centric. I don't know if
11 that brings any added value, but that's what
12 the course titles -- that's what they
13 indicate.
14 Q Okay. And what would you -- let me
15 just ask you, just basically --
16 A Sure.
17 Q How would you define internal
18 corrosion? And how would you define internal
19 erosion?
20 MR. DRAGNA: Pipelines or wells? I'm
21 sorry, Darryl.
22 MR. GRUEN: Q Let’S start with wells.
23 A I have very little expertise with
24 well casings. I have a little more expertise
25 with pipelines, so I want to qualify that
26 right away.
27 So your question was what again?
28 Q How would you define internal

1 corrosion with regards to down-well?
2 A It’s kind of a broad -- can you
3 help me a little bit?
4 Q It’s meant to be broad, because I'm
5 trying to understand the depth of your
6 expertise or how you could explain to us your
7 expertise as an internal corrosion
8 technologist?
9 A Like I said, principally, my
10 efforts, my focus, was not down-hole.
11 Q Okay.
12 A Another group deals with down-hole
13 stuff.
14 Q Okay.
15 A What I'm considering is what's
16 going with the pipeline, you know, that are
17 on the surface.
18 Q And when you say what's going on
19 the pipeline on the surface, how would your
20 expertise as internal corrosion technologist
21 apply there?
22 A Well, it helps me to understand the
23 corrosion mechanisms on pipelines where it’s
24 likely to occur, how to monitor for it, and
25 how to mitigate it. So, principally, monitor
26 and mitigate.
27 Q And, in this case, given that we're
28 talking about internal corrosion, you're

1 talking about inside the pipe?
2 A Yes, sir.
3 Q Um -- and I think at the risk of
4 restating what was asked earlier, would you
5 consider yourself being a subject matter
6 expert for cathodic protection as well as
7 corrosion?
8 MR. DRAGNA: Again, aboveground?
9 Belowground?
10 MR. GRUEN: Let’s start with below
11 ground.
12 THE WITNESS: Can you ask that again?
13 I just want to be clear.
14 Q Absolutely. I don't blame you when
15 there's back and forth between the attorneys.
16 So, just, would you consider
17 yourself a subject matter expert for cathodic
18 protection for metal, specifically, pipes
19 below ground?
20 MR. DRAGNA: I'm sorry. One
21 clarification. There's lateral pipes that
22 are belowground, and there are wells that are
23 vertical. So?
24 MR. GRUEN: I purposely --
25 MR. DRAGNA: Because they are
26 different.
27 MR. GRUEN: I purposefully left it
28 undistinguished.

1 Q And if you mean both, maybe we can
2 kill two birds with one stone. I'll ask it
3 one more time just to clarify.
4 A Sure.
5 Q So, would you consider yourself a
6 subject matter expert for cathodic protection
7 with regards to cathodic protection, with
8 regards to pipes both down-well and
9 horizontal?
10 A Yes.
11 Q Thank you. All right.
12 I wanted to -- you talked about
13 going back to the study by Schlumberger.
14 Do you recall talking about that?
15 A Yes.
16 Q And I think you mentioned as part
17 of that study it was known there was a CP, or
18 cathodic protection, evaluation tool for one
19 of three wells at Aliso.
20 Did I understand that right?
21 A Yes. To my understanding, it was
22 done on one well.
23 Q Okay. So I would like to ask you
24 some questions about the evaluation tool if I
25 could?
26 A Yes, sir.
27 Q Okay. Are you familiar with the
28 evaluation tool?

1 A Yes, sir, I am.
2 Q And what is the purpose of the
3 evaluation tool?
4 A The purpose of that tool -- and in
5 cathodic protection, we have many tools. You
6 know, we have many different ways of
7 attacking an issue. And CPET, as is it's
8 known, Schlumberger owns the trademark on
9 that. But there are similar tools to that
10 that have been employed through the years.
11 So -- I'm sorry. I got lost in my own --
12 what was your question?
13 Q That's okay. I appreciate it. And
14 it might be a simple question and very
15 complicated answer, so I'm happy to repeat
16 it.
17 A Okay.
18 Q What is the purpose of the
19 evaluation tool that was in the Schlumberger
20 study?
21 A Okay. What it’s trying to show is
22 where are the anodic spots on the casing.
23 And it’s principally looking -- I mean, it’s
24 giving the cathodic spots. But what we're
25 looking for is are there any anodic spots on
26 that well casing.
27 Q So in looking for the anodic spots
28 on the well casing -- why is it looking for

1 the anodic spots on the well casing?
2 A That's where you can -- it’s a tool
3 to help you to look for a likely spot where
4 you have -- where corrosion may be occurring.
5 If you have an anodic spot, it has the
6 potential for corrosion.
7 Q Mm-hm. So the more anodic spots
8 that you have on a pipeline, if I'm
9 following, the more spots you have where
10 there's a potential for corrosion on the
11 pipeline.
12 Am I following?
13 A Typically, I mean, you know,
14 typically there may be multiple spots --
15 anodic spots. And as with an E-LOG I, these
16 are all tools that help us assist in
17 determining -- and, actually, CPET is not a
18 perfect tool in itself either, but the
19 principle used for these is to determine,
20 number one, how much cathodic protection, how
21 much current, is needed to protect the well,
22 and if it’s effective at protecting the well
23 casing.
24 Like, there are plenty of CPET
25 reports that I've read over the years. It
26 may only indicate that you're protecting a
27 portion of the well casing or all of it. So
28 it just depends. And that, in itself, isn't

1 perfect when I talk to my industry peers.
2 Q And so it's giving you a number of
3 factors by which to evaluate the
4 effectiveness of cathodic protection on a
5 given well?
6 A Yes, it's another tool -- it's not
7 perfect. And I learned that after -- because
8 I -- as a NACE nerd, as it were, when I go to
9 the NACE conferences, every year, I belong to
10 several -- I attend the same sessions, as it
11 were, and one of those being well casings. I
12 want to know what other operators are doing
13 around the world and what tools they employee
14 in providing cathodic protection for well
15 casings.
16 Q Did you attend those meetings
17 during your tenure from 2009 to 2017?
18 A Absolutely. I'm very active in --
19 as a matter of fact, I'm very active SBO186.
20 And I'm one of a few people involved in -- I
21 mean, I was actively involved in that
22 standard.
23 Q And can you describe briefly, at a
24 high level, the standard of SBO186?
25 A Basically, what that standard says
26 is, it -- and, again, NACE -- especially in
27 well casings, you know, may I just?
28 Q Please.

1 A Like, with horizontal pipelines,
2 that is so well-defined. Like I said, I can
3 go out, you can go out with me, and we can
4 make a determination "Is the cathodic
5 protection effective on this pipeline?" We
6 can do that by going out with a multimeter
7 and half cell, and we can make that
8 determination. On well casings, it is not
9 that easy. So, usually, when -- you know, so
10 the standards are more prescriptive. Even in
11 our code, they are very -- I mean, they can
12 be very perspective in that sense.
13 However, on well casings, that is
14 not the case either by code or even in using
15 NACE as a guidance. There's no -- there's
16 not a lot of meat in there. There's a lot of
17 room for interpretation and experience.
18 So my effort, and the gas company
19 supported me in this, is going to these NACE
20 conferences and being part of these teams and
21 observing what are other operate areas doing
22 without -- 'cause if you look at the SPO186,
23 it’s -- it give you guidance or gives you
24 principles. But the specificity, it doesn't
25 tell you exactly how to conduct an E-LOG I,
26 for instance. And if you look at the
27 standard itself, it has an old picture of a
28 CPET, or that type of tool, that existed many

1 years ago.
2 Q Hmm. Okay.
3 A So there's -- you know, to get out
4 ahead of it, I talk to other operators and
5 other contractors that -- so, I'm sorry. I
6 probably got off target there.
7 Q Actually, not at all. That's most
8 helpful, and I appreciate you shedding light
9 on that.
10 So just in your -- during your
11 tenure for SoCalGas, not as contractor, from
12 2009 too 2017, I think some of the questions,
13 just to specify the timeline, let’s focus on
14 that for the moment --
15 A Okay. All right.
16 Q So did you work on predecessors to
17 SPO186?
18 A No. The NACE practices are -- they
19 are updated -- I think -- I forgot -- but the
20 what's frequency is -- so I think, right now,
21 SPO186 it's "dash" -2007. So it was last
22 revised in 2007.
23 Q Oh, I see. Okay.
24 A So we're working on that now, and I
25 think it's near completion.
26 Q And is that an effort by you and
27 others in the industry, to create -- to work
28 on SPO186?

1 A Any NACE member can be apart of and
2 have input --
3 Q Yeah.
4 A Usually if an internal corrosion
5 guy that specializes in microbial corrosion,
6 he's not going to get involved in a well
7 group, so it’s... and, likewise, you know,
8 I'm not going to go into AC mitigation or
9 things like that.
10 Q What was -- was Southern California
11 Gas Company getting input and following the
12 SPO186 guidelines?
13 MR. DRAGNA: With respect to?
14 MR. GRUEN: Q In general?
15 A Well, I would bring back, because I
16 was -- again, like, I'm -- I would bring back
17 that information.
18 Q Yeah.
19 A And I would utilize it, whatever
20 information I had, trying to stay ahead and
21 learning because, you know, I'm continually
22 looking to improve our system. And, like,
23 what I knew last year, I know better now. So
24 I'm always looking to improve on previous
25 understanding and --
26 Q Okay. Did you make any remember
27 recommendations for SoCalGas to follow
28 during -- as a result of your NACE conference

1 meetings regarding SPO186?
2 A The determination whether cathodic
3 protection to a well casing, that wasn't my
4 decision. I provide a technical advice, as
5 it were, or suggestion. And I realize that I
6 am just a part of the entire integrity of
7 whatever the system is, whether it be
8 down-hole or horizontal.
9 Q Sure. I appreciate your point that
10 you're giving technical advice.
11 Let me just ask, what was the
12 nature with regards to cathodic protection of
13 the technical advice you provided to Southern
14 California Gas Company related to your NACE
15 meetings on SPO186?
16 A So what did I bring back to the gas
17 company?
18 Q Exactly?
19 A Okay. My personal knowledge.
20 So if I ever want to apply CP, then
21 I would use that standard practice as a
22 guideline for how to employee that, how to
23 use it.
24 Q If we wanted to ask for the
25 SPO186-2007 version, how would we identify
26 it? How would we identify it if we wanted to
27 issue a data request so we asked for it
28 accurately?

1 A It’s -- and I'm sure your
2 organization has access to all the NACE
3 standards, but --
4 Q Okay.
5 A -- the title of it is SPO186-2007
6 Application to cathodic protection -- I'm
7 mumbling it all. I don't remember the title.
8 It’s specific to well casings.
9 Q I think that's helpful enough.
10 Maybe if we could work with Counsel to be
11 sure that we have the right name of the
12 document, could we do that?
13 MR. DRAGNA: We're always willing to
14 help you guys.
15 MR. GRUEN: Q Well, thank you.
16 So did you make any recommendations
17 based on your SPO186 meetings? If I could
18 call it that for shorthand? Any advice or
19 recommendations or technical advice about
20 cathodic protection for any wells?
21 A I would always -- or not always,
22 but I often suggested to the fields that
23 didn't have CP -- except for Montebello and
24 Playa Del Rey. So it was only specific to
25 Aliso Canyon. I'm -- I made offers to apply
26 CP to well casings there. And that was just
27 a general, shotgun blast.
28 Q What was the basis for you making

1 offers to do CP on given wells at Aliso?
2 A I'm just always -- I -- not knowing
3 if CP was effective or not, I just made a
4 suggestion to the principals that, "Hey, do
5 you want me to put CP on these wells?" And
6 so I just made it as an offer. I'm not
7 saying you must. I'm not a decision maker in
8 that way.
9 Q Sure, I got you. So how many wells
10 would you say you offered to do CP on at
11 Aliso from your tenure from 2009 to 2017?
12 Well, I made just a general offer. "Hey, I
13 can put CP on these wells." So in the
14 general sense, that's an open sense. And,
15 specifically, I asked to -- if they wanted me
16 to protect the two new well casings that I
17 learned about. And that's Porter 50B and C?
18 A Yes.
19 Q And the general offer was to put CP
20 on all the wells at Aliso?
21 A Any or all, yes.
22 Q Okay. When did you make such an
23 offer?
24 A When I --
25 Q I don't want you to guess. I see
26 you struggling with that.
27 A Yeah. I'm struggling with that.
28 Q Would it have been toward the

1 beginning of your tenure from 2009 to 2017,
2 approximately, generally speaking?
3 A It was fairly early on. I'm not
4 sure. Because, you know, being the new cat
5 in storage, I'm concentrating my efforts on,
6 like, where I really needed to drill in and
7 concentrate on. So, you know, I'm managing
8 multiple demands. So I just -- in passing, I
9 would ask, like, Jim, "Jim do you want me to
10 put CP on these well casings there at Aliso?"
11 Q Jim? Jim being?
12 A Jim Mansdorfer.
13 Q Okay. Sounds like you had that
14 number of conversations with him about making
15 these offers?
16 A More than one, probably more than
17 two. Maybe two or three that I remember in
18 conversation, yes, sir.
19 Q Okay. So how many -- you talked
20 about 02, lack of 02, I think in the system,
21 being a basis for Mr. Mansdorfer to say not
22 to do CP on one of the wells?
23 A That's one of the responses.
24 Because I was trying to get more out of him,
25 and that's what he indicated.
26 Q Okay.
27 A Lack of 02.
28 Q In response to how many offers?

1 A You know, I -- I know, fairly
2 certain, that it was two to three were in
3 discussion.
4 Q Okay.
5 A Possibly an email. I don't -- it's
6 been so -- I mean, I probably put out
7 thousands of emails, so -- but I can recall
8 the conversations with certainty.
9 Q What was your reaction when you
10 heard Mr. Mansdorfer's response about a lack
11 of 02 in the system being a basis for not
12 accepting an offer?
13 A You know, I don't know exactly all
14 what he's thinking. But what I can say is
15 that Jim has a far more understanding of the
16 integrity of that well than I do. They do
17 for more testing of the integrity of those
18 wells than I can ever imagine. So -- and his
19 education -- I know there are many components
20 in his education that probably included
21 metallurgy and corrosion. So I -- you know,
22 I had an appreciation for his education and
23 background in the industry.]
24 Q I appreciate that.
25 A Yeah.
26 Q I appreciate that. You said, in
27 terms of your basis for making offers and --
28 I wanted to just clarify. It sounds like

1 the -- the offers were for any and all --
2 A Yes.
3 Q -- wells.
4 A Yes.
5 Q Not only at Aliso, but also, at the
6 other storage facilities? The other storage
7 fields, rather.
8 A No, because we also had Playa del
9 Rey and Montebello, the -- the small
10 production field that we were operating, and
11 then a small Whittier field. It was a
12 decommissioned, I think, storage field.
13 Q Okay. So which fields did the
14 offer included (sic)? It included Aliso,
15 Goleta, Honor and Playa del Rey, then?
16 A Well, it was implied, because
17 Goleta was already -- all the well casings
18 were under CP.
19 Q Uh-huh.
20 A And so -- and it's implied at Honor
21 Rancho, any wells, new anything, that I -- it
22 was -- it was assumed that I would continue
23 that there.
24 Q Okay.
25 A But -- but, that wasn't true for --
26 for the other fields, necessarily.
27 Q Okay. So the offer was everything
28 except Goleta? Let me state it positively --

A Okay. All right.
Q -- so we can --
A Yeah.
Q Which fields is it for?
A It was only for Aliso.
Q Only for --
A Yeah.
Q -- Aliso?
A Yeah.
Q Got you. Okay. And there's a -- I started out asking about the evaluation study that Schlumberger did, and you're -- you're familiar with that?
A Yes.
Q Is it common to see evaluation studies done for -- for wells?
A You're talking about the -- that specific tool, cathodic protection evaluation tool?
Q Thank you.
A Okay.
Q Precisely said. That's exactly what I mean.
A Okay. Or -- or CPET.
Q Or CPET. Correcting an attorney is very helpful. I appreciate that.
A Okay.
Q Thank you. Yeah. That's exactly

1 what I mean.
2 A Well, let me say this, because like
3 I said, The Gas Company -- with except of
4 last year, I paid for it myself, to go to the
5 NACE conference; but, they've been very
6 supportive in sending me to NACE conferences.
7 And knowing what -- number one, the
8 availability of the CPET -- number one, we
9 all talk about the same things, what other
10 operators are doing.
11 Q Yeah.
12 A And we're talking operators from
13 natural gas fields to producers, oil
14 production or gas production. So the -- the
15 common thread is that there's one or maybe,
16 at best, two tools in the entire north
17 continent of the united -- or the North
18 America continent. So the use of those tools
19 is very very limited, and it -- the
20 availability of that tool is very very
21 limited; and furthermore, I think, even the
22 more as I learn, that tool is not entirely
23 definitive. It is another tool in our
24 toolbox to help us evaluate the cathodic
25 protection on a well casing.
26 Q Yeah.
27 A So the availability, with two --
28 with -- I don't know how many well casings

1 are in it. And sometimes that tool gets
2 loaned out to an international operator.
3 Q So when you say the tool is
4 limited, I think I'm understanding that
5 there's one tool that is shared, literally?
6 A Yes.
7 Q If -- if I was to analogize the
8 tool to being one special box, if you will --
9 A Yeah. Yeah.
10 Q -- and each operator has to take a
11 turn --
12 A Yeah.
13 Q -- using that specific special
14 box --
15 A Yes.
16 Q -- to do the evaluation, would that
17 be a fair characterization?
18 A I think that's a pretty fair --
19 yes.
20 Q Okay. I see. So Southern
21 California Gas Company had its turn for one
22 well?
23 A Yes.
24 Q And has Southern California Gas
25 Company had a turn using the evaluation tool
26 before or since then?
27 A To my knowledge, no.
28 Q Okay. Can you elaborate on the

1 limitations of the tool?
2 A Yeah. So what the tool does -- and
3 I --
4 MR. DRAGNA: I'm sorry. When we're
5 talking tool, we're talking about CPET?
6 THE WITNESS: Yes.
7 MR. GRUEN: I think so. Let's just
8 clarify, too.
9 MR. DRAGNA: That would be helpful.
10 MR. GRUEN: It's a fair question.
11 Q When we talk evaluation tool and
12 CPET, we're talking about the same thing.
13 Right?
14 A Same thing.
15 MR. DRAGNA: Is CPET C-P-A-T?
16 THE WITNESS: CPET.
17 MR. GRUEN: Q C-P-E-T.
18 A Yeah, cathodic protection
19 evaluation tool.
20 Q Okay.
21 A And that's how Schlumberger terms
22 their tool. That's their tool.
23 Q Okay.
24 A All right. So your question was,
25 again? I'm sorry.
26 Q The question was about limitations
27 of the tool, but I think maybe I'll broaden
28 it to just ask you to describe the tool, if

1 you would.
2 A Okay. Sure.
3 Q And --
4 A So -- and I -- forgive me. I'm --
5 I've been a NACE instructor for a few years,
6 and so I get a little nerdy about this stuff.
7 Okay?
8 Q Please.
9 A If I were to turn on a hose bibb
10 here, and it's putting out five gallons per
11 minute, if I were able to measure it, the
12 output, and I turn on the -- the hose bibb,
13 and it put out five gallons per minute, and
14 if I go downstream, let's say, 20 feet, and
15 it's putting out two gallons per minute --
16 Q Uh-huh.
17 A -- what would that -- what would
18 that suggest to you? Five here, and two
19 there, what does that suggest?
20 MR. DRAGNA: Somebody's stealing water.
21 THE WITNESS: Yeah, somebody's stealing
22 water. The water's going somewhere.
23 MR. GRUEN: Q Okay. I'm glad you
24 answered it --
25 A Yeah.
26 Q -- because, as a lawyer, I'm liable
27 to hurt myself. So that's helpful. Yeah.
28 A Okay. So what this tool does, as

1 it's being lowered and raised in the well
2 casing, it's taking a difference in
3 potentials on these contact points that
4 are -- they're blades that contact the inside
5 space of the pipe.
6 Q Uh-huh.
7 A And they're at a known distance.
8 And, through the use of this tool, they can
9 determine that there is current pickup or
10 current discharge --
11 Q Uh-huh.
12 A -- as that tool is being lower --
13 lowered or raised through the well casing.
14 It will tell us if something is leaving that
15 well casing.
16 Q Okay.
17 A So the tool is limited in that --
18 number one, the availability. I'm not the
19 only one that -- that is concerned about that
20 in the industry, you know. When we meet
21 every year, it's the same thing. You know,
22 we talk about what are you employing to
23 determine your CPN well casings.
24 Q Yeah.
25 A And we all come back -- I mean it's
26 almost the same story every time. But --
27 Q Yeah.
28 A -- the availability of the tool.

1 The tool, in itself, is another tool. It's a
2 good tool, but it's -- even that, it's --
3 it's not perfect. Sometimes -- as these
4 blades are making contact to the inside of
5 the pipe, sometimes they don't make good
6 contact.
7 Q Uh-huh.
8 A There's a certain preparation that
9 needs to take place in order for the tool to
10 be more accurate.
11 Q Uh-huh.
12 A If there's scale or some kind of
13 deposits on the inside of the pipe, it may
14 affect the accuracy of the tool.
15 Q Uh-huh.
16 A And the tool itself is just -- it's
17 not perfect. It's another tool in our tool
18 bag to help determine the effectiveness.
19 Q And the one time that -- that the
20 tool is used by SoCalGas, what were the --
21 the findings of the tool?
22 A Okay. Now, the -- the tool wasn't
23 used just once at SoCal.
24 Q Oh, I see. I may have --
25 A There was --
26 Q -- misunderstood.
27 A There was a similar tool that was
28 employed in the '70s --

1 Q Oh.
2 A -- that was much more antiquated,
3 as it were.
4 Q Okay.
5 A So are we talking about those or
6 the one at the FF well?
7 Q Why not -- why not start with
8 the -- the one that was used from 2009 to
9 2017, the -- the --
10 A Yeah.
11 Q -- Schlumberger study --
12 A Right. Okay.
13 Q -- that used the -- the CPET?
14 A Yes, sir.
15 Q What were the findings of the
16 Schlumberger study with respect to that CPET?
17 A The -- the use of the CPET,
18 essentially what it said -- it suggested
19 applying cathodic protection to that well
20 casing.
21 Q You don't remember which well we
22 were talking about?
23 A No. No. I mean -- no. But, I
24 remember -- I remember reading the -- the
25 company's big accordion-type reports, you
26 know.
27 Q Okay. And I don't recall. Forgive
28 me, if you said.

A Yeah.

Q What was the decision that was made with regards to the -- the study?

A Decision?

Q Let me back up.

Did you offer to put CP on the well where the Schlumberger study recommended applying cathodic protection?

A That was before my time.

Q Oh, I see.

A Yeah. So this was conducted in, I want to say, nine -- I don't even remember. I -- I don't remember when they ran that tool. So it was -- but, it was prior to me coming to storage.

Q Okay. Do you know if the -- if SoCal ended up putting cathodic protection on the well that the Schlumberger study recommended --

A Yes, they did.

Q -- on the --

A Yes.

Q They did. Okay. And have you reviewed the Schlumberger study?

A I looked at the log, yes, I did.

Q Okay. So it gave you data points about one well, and --

A Yes.

1 Q -- you saw the findings and
2 recommendations on one well?
3 A Yes, sir.
4 Q Given your knowledge about other
5 wells, what extrapolations, if any, did you
6 make from the study?
7 MR. DRAGNA: I'm sorry. What do you
8 mean?
9 MR. GRUEN: Let's ask the --
10 MR. DRAGNA: Well, did he
11 extrapolate --
12 MR. GRUEN: Let's go off the record for
13 a second.
14 MR. DRAGNA: Yeah.
15 (Off the record.)
16 MR. GRUEN: Could we go back on the
17 record?
18 THE WITNESS: Could you ask it again?
19 MR. GRUEN: Q I absolutely can.
20 A Okay.
21 Q Given your knowledge and your
22 expertise with wells at Aliso, what
23 extrapolations, if any, did you make from the
24 study?
25 A Well, I -- I mean I really want to
26 make sure there's a distinction on if I
27 observe that this tool said that that CP was
28 effective or they -- the recommendation of

1 the report, if you call it a report, was that
2 CP was necessary for that well, or they
3 recommend a CP for that well, something along
4 those lines, what can I extrapolate, is that
5 your question, from that study?
6 Q (Nods.)
7 A Well, number one, I wish -- in a
8 perfect world, I wish I can use a tool on
9 everything in the world. Right?
10 Q Sure.
11 A The practicality of that -- I mean
12 it's -- it's just prohibitive. But, so what
13 I'd suggest -- I mean technically, and I'm
14 not trying to parse words here, but it -- it
15 proved to be effective for that well casing.
16 It may or may not prove effective for other
17 well casings. Like when they used the tool
18 in -- in the '70s, the tool determined that
19 CP was not effective like in Playa del Rey.
20 So I don't know. Maybe you can ask another
21 question --
22 Q Sure --
23 A -- to help me get centered --
24 Q Yeah.
25 A -- because I get off-centered easy.
26 Q Your -- your answer was helpful.
27 A Yeah.
28 Q And I'll try.

A Okay.

Q What similarities did you notice between the well that was the subject of the evaluation tool and the Schlumberger study and the other wells at Aliso?

A To my knowledge, the only study, to my knowledge, that was ever done at Aliso Canyon was done on that well casing. That's it.

Q Okay.

A And I -- so Aliso Canyon is a huge field. It's -- it's -- at the time, it was over a hundred wells, and they spread out. I mean it's a tremendous footprint. And this particular one was way out on the east end. It was on the -- like the -- one of the farthest reaches of the -- of the -- the facility. So I -- I'm sorry. I forgot the -- the question, again.

Q Similarities between the -- the well that was the subject of the Schlumberger study --

A Yeah.

Q -- and other wells at Aliso.

A Yeah. So I mean there was -- the -- the tool was only done on that one well casing over there. And the adjoining well casings, because they were in that

1 same -- there's -- they were in that same
2 pad, that same area of the field, and they
3 were on the -- on the far -- farthermost east
4 portion of that field; so, you know, whatever
5 we did to that one well -- I can't speak to
6 their rationale back then, but I'm just
7 thinking they just included the adjoining
8 wells there.
9 Q Okay.
10 A But, there's no -- to my knowledge,
11 no other tool ever employed at Aliso Canyon.
12 Q Okay. You raise -- I think -- I
13 think I've got another question or two, and
14 then I'm probably done.
15 A Uh-huh.
16 Q We've gone through this --
17 A Yeah.
18 Q -- a bit, and you've been really
19 really helpful.
20 A Thank you. I'm trying to be.
21 Q Thank you. Thank you. Did the --
22 the results of the CPET raise any concerns
23 for you when you reviewed it?
24 A Yes.
25 Q What were those?
26 A I -- in a perfect world, I'd like
27 to have that tool run in more places.
28 Q Uh-huh. Possible to replicate the

tool?

A I'm sorry?

Q Is it possible to make another of the same tool that -- that was used there? Did you consider that?

A You mean to actually construct a tool?

Q Yeah.

A To tell you the truth, I'm -- I'm looking for investors. Really. You know, the fact is there are other operators out there that want to use the tool, but it's simply not available. And -- and then, even in our discussion in our, you know, well casing group, we talk about this.

Q Yeah.

A And principally, you know, natural gas storage is this much of the big huge pie, and when you talk about the well casings that are in the earth today, it's mostly production. The people that put in a well casing, and they want to pull -- suck out the oil or gas, and ten years later, they don't care about their wells. So who's -- they're the ones that are kind of pushing the industry, as it were --

Q Okay.

A -- and the availability of the

1 tool. But --
2 Q Okay. Just for -- for my
3 understanding, a couple other questions. I
4 think I'll stop there, for the moment, on the
5 Schlumberger --
6 A All right.
7 Q -- and the CPET. Thank you for --
8 A Okay. Yeah.
9 Q -- shedding light.
10 Do you remember talking to
11 Mr. Bruno about the rectifier?
12 A Yes, sir.
13 Q Okay. So the rectifier you would
14 use on wells that have cathodic protection.
15 Is that right?
16 A Yes, we use rectifiers alone.
17 Q And would you use a rectifier on a
18 well that does not have cathodic protection?
19 A No. I mean just -- it's implied
20 that, if you put CP onto something, it's got
21 to have a DC current source --
22 Q Yeah.
23 A -- and it would be the rectifier.
24 Q So the rectifier's the source of
25 DC --
26 A Yes.
27 Q -- current?
28 A Yes.

1 Q That was just for my clarification.
2 Thank you.
3 A Yeah.
4 Q The -- do you recall Mr. Bruno
5 asking you about Appendix D of 49 Code of
6 Federal Regulations Part 192?
7 A Yeah.
8 Q Do you recall Mr. Bruno --
9 A I recall --
10 Q -- asking about that?
11 A -- that question, yes.
12 Q Okay. So -- and I think the
13 question with -- was with regards to E-log-I.
14 Does that sound right?
15 A I -- I'm recalling, yes. It --
16 yes.
17 Q All right. I'm going to read you a
18 portion, and I can share this with you, too,
19 if you like.
20 A Okay.
21 Q But, just I'm reading from Appendix
22 D --
23 A Okay.
24 Q -- of Part 192. And it's little
25 "I" -- I'm sorry. Roman I, Part A, sub four,
26 and it says, "A voltage at least as negative
27 (cathodic) as that originally established at
28 the beginning of the Tafel segment," and

1 Tafel is spelled T-a-f-e-l, "of the E-log-I
2 curve. This voltage must be measured in
3 accordance with Section IV," Roman four, "of
4 this appendix."
5 Does that -- is that familiar to
6 you?
7 A Vaguely. I mean, really, I'd like
8 to read the thing, and --
9 Q Absolutely.
10 A -- in context, because I'd like to
11 know what are they talking about.
12 Q Absolutely. And that's -- that's
13 reasonable. I should get another thing.
14 But, if -- if I can show him this,
15 and Ms. Clorfeine --
16 MS. CLORFEINE: Sure.
17 MR. GRUEN: -- if I can show him this,
18 and maybe stand here with him, because I only
19 have one copy. So --
20 MS. CLORFEINE: Sure.
21 THE WITNESS: Do you want me to come
22 there, or do you want me to --
23 MR. GRUEN: Q I'm happy to go over
24 there --
25 A Okay.
26 Q -- and stretch my legs.
27 A You get the exercise.
28 Q Okay. So here, I'm just -- here.

I can show Ms. Clorfeine, too.

MS. CLORFEINE: Can I just see this?

MR. GRUEN: Yeah. This is -- this is a --

MS. CLORFEINE: Okay. It's that whole part. Okay.

MR. GRUEN: It's the whole part.

MS. CLORFEINE: Okay.

MR. GRUEN: And I should clarify. It is slightly outdated. There have been some updates to the part, but I believe that the part is accurate, for purposes of what we're talking about. That's my understanding.

Q So this is a reference to Appendix D, and it's Criteria for Cathodic Protection and Determination of Measurements, and you see, under -- under little "I," it's in very small hard to read print, it says, "Criteria for cathodic protection," I believe.

A Uh-huh.

Q And where I was referencing, this is for steel, cast iron and ductile iron structures, and then you have your finger on exactly what I was referencing.

A Okay.

MS. CLORFEINE: So Darryl, do you want him to take a quick look at this to read this?

1 MR. GRUEN: Absolutely. Why don't we
2 go off the record for one moment?
3 (Off the record.)
4 MR. GRUEN: Let's go back on the
5 record.
6 THE WITNESS: Yes.
7 MR. GRUEN: Q So, while we were off
8 the record --
9 A Uh-huh.
10 Q -- Mr. Selga, Ms. Clorfeine and I
11 reviewed a somewhat outdated copy of the
12 PHMSA regulations, P-H-M-S-A, 49 Code of
13 Federal Regulations, Part 192 --
14 A Okay.
15 Q -- Appendix D --
16 A Okay.
17 Q -- and we looked at the Roman one,
18 subpart A, little four --
19 A Okay.
20 Q -- and I believe I read it for the
21 record before we went off.
22 Do you want to read that, since you
23 have it in front of you, just to make it --
24 A Okay. This is -- the appendix -- I
25 mean -- and that's why I had the -- it refers
26 to the appendix via 192.461 and following.
27 Q Uh-huh.
28 A So where it talks about cathodic

1 protection.
2 Q Yes.
3 A Okay. So -- and I'm assuming that
4 this is talking about criteria, if I'm
5 reading this correctly. It's the Appendix D
6 that had -- it says, "Criteria for Cathodic
7 Protection and Determination of
8 Measurements."
9 Q Yeah.
10 A And "I" talks about criteria for
11 cathodic protection, and one of the criteria,
12 or one of the criterion, is number four, a
13 voltage at least as negative (cathodic) as
14 that originally established at the beginning
15 of the Tafel segment of the E-log-I curve.
16 Q Are you familiar with that
17 criterion?
18 A Yes.
19 Q Recognizing that that criterion
20 applies to horizontal pipelines, as stated
21 in -- in the PHMSA guideline --
22 A Yeah.
23 Q -- the PHMSA regulations --
24 A Right. Right.
25 Q -- that we've just talked about --
26 A Uh-huh.
27 Q -- is it your understanding that
28 you would use that criterion similarly for

1 down-well?
2 MR. DRAGNA: I -- you know, just for
3 purposes of the record, there's a whole lot
4 of foundational issues that haven't been
5 established in response to the -- that last
6 question.
7 MR. GRUEN: Fair enough.
8 MR. DRAGNA: Like I mean just to be
9 fair to the witness.
10 MR. GRUEN: Fair enough.
11 Q So maybe I can cut through them --
12 A Okay. All right.
13 Q -- by asking just --
14 A Yes, sir.
15 Q -- this -- this one question.
16 For -- for down-well -- let's
17 just -- just taking out the -- if I just used
18 the words that are here, without referencing
19 49 CFR Part 192, and I were to just ask you,
20 for down-well, do you use a voltage at least
21 as negative cathodic as that originally
22 established -- established at the beginning
23 of the Tafel segment of the E-log-I curve,
24 would that be a criterion that would -- that
25 you would use for cathodic protection when
26 looking at down-well issues?
27 MR. DRAGNA: I'm sorry. Do you mean as
28 a matter of law?

1 MR. GRUEN: No.
2 MR. DRAGNA: As a matter of practice?
3 As a matter of interest? I mean there's --
4 what are you talking? You're citing a
5 section of a statute that doesn't apply to
6 the question, and asking him whether he uses
7 it. In what context? Just to be fair to the
8 witness.
9 MR. GRUEN: I think -- I think I see
10 your question.
11 Q So for purposes of using your
12 technical expertise, your technical
13 background as a cathodic protection expert,
14 nevermind that this is a regulation --
15 A Okay.
16 Q -- is this a criterion that you
17 would use in order to determine whether to
18 offer cathodic protection to Southern
19 California Gas Company?
20 A I'm not entirely comfortable with
21 the question, but would I say -- it's a
22 criterion to what, again?
23 Q To -- to offer cathodic protection
24 for a well at Aliso to Southern California
25 Gas Company.
26 A I think, when we talk a criteria or
27 criterion, we're saying that we are using --
28 we use criteria to determine are we meeting

1 the -- are we -- are we sufficiently applying
2 cathodic protection to something. Okay?
3 In the case of E-log-I, I have
4 never employed the use of E-log-I on like
5 horizontal. We have far superior ways to
6 determine or meet criteria or criterion.
7 Well casings? No, I -- I wouldn't -- the
8 only thing I use E-log-I for is to determine
9 how much current is needed to protect that
10 well casing.
11 Q Okay.
12 A And it may or may not protect the
13 entire portion. It's just -- it's a target.
14 It's something that we try to give.
15 Q Thank you.
16 A Yes, sir.
17 Q And just -- you've been more than
18 helpful.
19 A Okay.
20 Q And I -- I'm gleaning the concerns
21 from counsel about this. Maybe there's
22 another way to get at this that -- that --
23 MR. DRAGNA: I think he answered your
24 question.
25 MR. GRUEN: -- addresses the concerns.
26 Okay.
27 MR. DRAGNA: I thought he answered the
28 question. But --

1 MR. GRUEN: I -- I think he did, too.
2 So let me -- let me ask him.
3 MR. DRAGNA: How about we take a break?
4 MR. GRUEN: Let me -- let me ask a
5 different one. I think we're almost done
6 here.
7 Q What is the source for the E-log-I
8 curve at Aliso?]
9 A What do you mean?
10 Q Where does the E-LOG I -- what's
11 the basis for establishing the E-LOG I curve
12 at Aliso?
13 A At Aliso?
14 MS. CLORFEINE: Down-hole?
15 MR. GRUEN: Q Down-hole.
16 A I mean, I use E-LOG I. It's a
17 field-testing technique that tells me how
18 much current is needed to protect a well --
19 cathodically protect a well casing.
20 Q Where does the technique come from?
21 A I'm assuming -- I don't know where
22 it came from. I can only guess that it's
23 been employed scientifically as a start.
24 It's just another tool.
25 Q Okay.
26 MR. GRUEN: Go off the record for a
27 second.
28 MS. CLORFEINE: Sorry. Before we go

1 totally off the record, I would like to
2 identify what you showed him on the record.
3 The right revision number so we can be clear.
4 MR. GRUEN: Sure, this is -- I'm
5 reading. This is U.S. Department of
6 Transportation Pipeline and Hazardous
7 Materials Safety Administration, Pipeline
8 Safety Regulations 49 CFR part 192, printed
9 August 2015.
10 MS. CLORFEINE: Great. Thank you.
11 MR. GRUEN: That is the reference that
12 we were reading from to identify Appendix D.
13 Okay. We can go off the record.
14 (Off the record.)]
15 (Whereupon, at the hour of 12:35
p.m. a recess was taken until 1:47
16 p.m.)
17 * * * * *
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1
2 AFTERNOON SESSION - 1:47 P.M.
3 * * * * *
4 MR. SHER: Back on the record.
5 Mr. Selga, thank you again for
6 coming back. You are still under oath.
7 THE WITNESS: Yes, sir.
8 EXAMINATION
9 BY MR. SHER:
10 Q The next set of questions are going
11 to pertain specifically to Aliso Canyon?
12 A Okay.
13 Q Okay. And in your role from 2009
14 to 2017, how much, if any -- and let's talk
15 about above-ground corrosion -- did you
16 notice at Aliso Canyon on a yearly basis with
17 regards to above-surface facilities?
18 A How much did I notice about what?
19 Q How much corrosion, if any, on a
20 yearly basis did you come across with regards
21 to above-surface facilities at Aliso Canyon?
22 A I'm not sure I understand the
23 question. So I understand what it's for.
24 But what you do you want to know about that?
25 Q Have you ever seen corrosion on
26 above-ground facilities at Aliso Canyon?
27 A Okay. So to further clarify, pipe
28 that is buried or exposed?

Q Let's go -- still talking about surface above.

A Okay.

Q Let's talk about exposed to the atmosphere.

A Okay.

Q How much corrosion, if any, on a yearly basis did you see on Aliso Canyon?

A Number 1, Aliso is a very large facility. A lot of pipe above ground there. There is occasional atmospheric corrosion noted. Nothing of significance. Just it needed to be addressed.

Q And would someone in your group address that?

A No, not specifically. No. That's not -- I'm a corrosion nerd I guess you can say. No. The people that do the patrol, they're responsible for identifying that.

Q Okay. I think Mr. Bruno asked some questions here. The cathodic protection isn't about finding corrosion; is that correct? It's about preventing corrosion?

A Yes, that's a fair distinction, yeah. And that only applies to that pipeline which is buried. CP has no effect on atmospherically-exposed pipeline.

Q Now, with regards to down-well

1 metal facilities at Aliso Canyon, have you
2 come across any corroded pipe from 2009 to
3 2017?
4 A No, sir.
5 Q And would you expect to have found
6 corroded pipe?
7 A I can't speculate on that. I don't
8 feel qualified to speculate on something like
9 that.
10 Q Are you aware of any instances at
11 Aliso Canyon where someone in the gas company
12 has pulled tubing from a well?
13 A At the gas company?
14 Q Someone working for the gas company
15 has pulled tubing?
16 A The only place I know with
17 specificity is Honor Rancho. I remember them
18 pulling the tubing at one well.
19 Q So in your experience at Aliso
20 Canyon, you're unaware of tubing being pulled
21 from a well?
22 A I know as a matter of practice that
23 they pull tubing. But I have no specific
24 instance to know where they pulled tubing.
25 Q Great. Great. Do you -- I think
26 the answer is no with regards to you. But do
27 you or anyone in your team or under your
28 supervision review or analyze pipe pulled

1 from the ground at Aliso?
2 A Pulled pipe from the ground?
3 Q Tubing pulled from the ground?
4 A No. No. That's usually the
5 underground storage folks, the underground
6 storage engineers, that is their -- that's
7 their baby not mine.
8 Q But as a cathodic protection
9 "nerd," as you've described yourself, would
10 you not be interested in looking at pipe
11 that's been pulled to see if there's been
12 some corrosion?
13 A Well, in respect to tubing, CP has
14 no relevance to tubing, because it's -- CP's
15 only effective on that surface that's in
16 contact with soil.
17 Q And just to clarify, the tubing is
18 in the casing; right?
19 A Yes, sir. That's correct.
20 Q So the tubing should never come
21 into contact with the soil; correct?
22 A Well, I can't speak to that. I'm
23 not a well expert. But typically that tubing
24 makes no contact with the -- with the soil.
25 Q Okay. Are you aware of the fact
26 that in some wells at Aliso Canyon, the gas
27 company was using both the casing and tubing
28 to pull and inject gas?

A I don't know that. I can't say if that's a fact. But my general knowledge they were using both, yes.

Q You had mentioned earlier this morning the potential for material to erode from the inside parts of the pipe, remember that?

A Yes.

Q Okay. I'm also struggling like Mr. Gruen to understand the difference between the erosion and internal corrosion. Is there a difference?

A Okay. Are we talking below ground or surface?

Q Help me here. Because in my mind there should be no difference between below ground internal corrosion and surface internal corrosion in a pipe. Am I wrong in that assumption?

A This is a pretty big subject. So we're -- your question was what again?

Q Well, you are an internal corrosion technologist; correct?

A Yes, sir. I'm certified as one.

Q You're certified as one. And in my mind -- and, again, I'm a lawyer so appreciate that I may muddle things -- but to me you've got a metal pipe. Let's say

11 inches in diameter. And what's the difference whether it's vertical, above -- sorry. Horizontal above ground or vertical in the ground with regards to internal corrosion of that pipe?

A Okay. Just speaking from my limited experience, normally -- well, let me just -- I can speak -- I can especially speak to horizontal piping surface, because that's where I've spent more time in.

Q Okay.

A Is we look for liquids where they accumulate. If we can find out where the water -- like a low spot or where water is starting to go up on an incline, I'm keyed into that.

But vertical piping, usually that's not an issue in that respect. And pipeline, that's -- if you follow the water, you -- that's where you want to monitor and possibly mitigate.

Q And I really appreciate that distinction, because that makes lot of sense to me. Could you have either bacterial or chemical internal corrosion on a vertical pipe?

A I mean, that's not where my area of expertise lies. I can only speak in general

1 terms on that.
2 Q So cathodic protection has nothing
3 to do with preventing chemical or bacterial
4 corrosion?
5 A And if it's in the internal surface
6 of the pipe as it were, no. CP has no affect
7 on that.
8 Q And would CP have an affect on
9 external microbial chemical -- or microbial
10 corrosion on the external pipe?
11 A CP can. I'm speaking in general
12 terms. CP can be effective in counteracting
13 the negative parts of microbial-induced
14 corrosion, yes.
15 Q And how does CP do that?
16 A CP, when -- and I'm not entirely an
17 expert on this, so I can just speak in
18 general terms again.
19 When microbes metabolize, they
20 create a -- essentially an acidic
21 environment. Acid and carbon steel they're
22 very inconsistent. So what cathodic
23 protection does, it also -- where microbes
24 would drive the PH down, and it creates an
25 environment where corrosion may occur or more
26 likely to occur.
27 When you drive CP, it raises the
28 PH. It may mitigate and can be used to

1 mitigate what we know as "MIC," or Microbial
2 Induced Corrosion.
3 Q Okay. So in your experience over
4 your career, you've either used or have seen
5 used CP to help mitigate MIC; is that
6 correct?
7 A No. No. It's been very very
8 limited. And what I say -- typically in
9 tanks and vessels where we might see some MIC
10 occurring. Where it's applicable -- where CP
11 can be used, I've used cathodic protection to
12 help mitigate any of those effects of MIC.
13 Q Okay. So --
14 A But that's where my limit -- that's
15 where I've -- I'm limited to that as into my
16 experience.
17 Q Okay. I appreciate that. As far
18 as you're aware, the five wells that
19 currently have cathodic protection at Aliso,
20 do you know where the cathodic protection was
21 placed to help mitigate any microbial
22 corrosion?
23 A I have no idea of that.
24 Q Okay. And would you or your group
25 test for microbial corrosion?
26 MR. DRAGNA: This is in wells again or?
27 MR. SHER: Jim, the context has all
28 been wells.

1 MR. DRAGNA: I'm sorry. All wells?
2 MR. SHER: The context has all been
3 wells.
4 THE WITNESS: I have -- no. Only
5 what's been produced from wells. I've asked
6 for samples. But that's always been at the
7 surface facility where we're able to get a
8 sample for instance.
9 Q How does one get a sample of
10 microbial corrosion?
11 A Um, we -- well -- typically, that's
12 a -- that's a whole other -- I mean, that's a
13 pretty big subject again.
14 Our company tests for microbes or
15 MIC at particular places. It depends on the
16 field, and I don't specifically know where
17 they test for bugs, in short, at Aliso
18 Canyon. But typically we get it at the
19 surface facility.
20 Q Who would be in charge of doing
21 that kind of testing if you know?
22 A That belongs to the underground
23 group. However, in our work to advance our
24 understanding of what's going on on the
25 surface facilities, I've asked for -- and
26 places and the certain protocols for testing
27 of both liquids, gas, and solids.
28 Q And these, again, would be more

1 surface facilities as opposed to down-well?
2 A Yes, sir. Yes, sir.
3 Q Okay. Are you finding that the
4 data is valuable?
5 A All data is valuable even if it's
6 negative or positive. It's still valuable.
7 Q Do you know of any ways to collect
8 evidence of microbial corrosion from
9 down-well?
10 A Can you ask that again?
11 Q So you talked about when you go to
12 these conferences on a regular basis, that
13 generally the same people and you have
14 similar questions, and you're talking about
15 what you're noticing in your storage fields;
16 correct?
17 A No. I mean -- I mean, I gather all
18 kinds of information on developing my
19 understanding of corrosion control.
20 Specifically cathodic protection.
21 Q Have you come across instances
22 where you and your colleagues at one of these
23 NACE conferences or a different conference,
24 where you're talking about microbial
25 corrosion?
26 A I've gone to many seminars on MIC,
27 yes.
28 Q And in those seminars, is anybody

1 talking about controlling MIC below ground?
2 A The great preponderance of our
3 discussion has always been on the pipeline.
4 All the, you know, what we would call the
5 surface facilities.
6 Q Is it that's too difficult to
7 determine whether there's microbial corrosion
8 down well? That's why it's not done?
9 A No, I don't -- I want to preface
10 this by saying I'm not an expert in
11 down-hole. And nor -- I'm not a real expert
12 on internal corrosion in respect to surface
13 either. You know, when I say -- when I give
14 an answer, I'm going to qualify that. I
15 don't claim to be an expert. I have a
16 certificate in it. But that doesn't mean I
17 have a full understanding.
18 Q I appreciate that. I don't mean
19 for the questions to come across in a -- I
20 don't know -- in a bad way. I'm just --
21 A I wasn't discerning that. I just
22 wanted to be clear on that.
23 Q I'm just trying to --
24 A Sure.
25 Q -- figure out what's going on. I
26 appreciate that if you don't have the
27 answers, that's totally appropriate.
28 A Thank you. Okay.

1 Q Okay. Give me one second.
2 If we can turn to what I believe
3 what's been marked as Exhibit 2, which I
4 handed you a piece of paper earlier today,
5 and it has "CPM Maturing." Do you see that?
6 A Yes, sir. I do.
7 Q Are you familiar with this
8 document?
9 A Yes, I am.
10 Q Can you tell me what it is?
11 A I received -- I think it's a weekly
12 report on orders that are maturing. In other
13 words, they're coming close to their due date
14 for inspection.
15 Q Let's do something very basic.
16 What does CPM Maturing mean?
17 A CPM is defined as monitoring in
18 respect to a DOT facility.
19 Q That would be DOT, Department of
20 Transportation?
21 A Yes, sir.
22 Q Now, do Department of
23 Transportation regs apply to what facilities
24 at Aliso?
25 A Those would be your inject and
26 withdraw pipelines.
27 Q Do the regs apply to down-well?
28 A No.

1 Q No?
2 A No.
3 Q So does -- we have, for example
4 here it says, "Aliso Canyon and total
5 maturing of 2." So what facilities are those
6 referring to?
7 A I have no idea. These look like
8 work orders. The work order may have several
9 inspections on it. And it's just telling me
10 that those work orders are maturing. It's
11 telling me, "Hey, heads up. They're
12 maturing."
13 Q By "maturing," meaning that the
14 work needs to get done before a certain date?
15 A No. It's just kind of -- this is
16 just -- it's a tool to help me or others that
17 they need to conduct their inspection. A
18 predetermined inspection that -- it's coming
19 up.
20 Q Do you -- are you aware of any CPM
21 logs, I guess? What would you call this
22 document?
23 A To me this is -- it's not --
24 nowhere is it required. It's a tool to help
25 us to make sure that, "Hey --"
26 Q It's a tracking tool?
27 A Well, yeah. I mean, yeah. It
28 tells -- what this does is it tells me and

1 anybody else -- because there could be other
2 associated -- there are other associated
3 activities that need to be completed like
4 bridges and spans or pipes exposed to
5 atmosphere, valves.
6 Q To the degree work was required on
7 down-well, one of the wells at Aliso, would
8 there be a document like this that would
9 cover that down-well work?
10 A If -- I can't speak to all the work
11 that's down-hole. All I can speak to is -- I
12 mean, I can certainly speak to cathodic
13 protection.
14 So I don't know how -- like UGS,
15 how they monitor or what they do. I have no
16 idea. I mean, I don't know their inspections
17 or what they -- what their frequency is.
18 That's all determined by them.
19 Q To the degree there was a corrosion
20 protection work order that was maturing --
21 A Okay.
22 Q -- it would show up on a piece of
23 paper like this potentially?
24 A Yeah, it would have a different
25 title. I think we called them "PM Plus." So
26 it would be a PM Plus maturing.
27 Q PM Plus?
28 A Yes.

1 Q And a PM Plus would refer to all
2 work orders relating to down-well cathodic
3 protection?
4 A No. PM Pluses can be used as a
5 means to conduct any maintenance or
6 inspection on any activity. CP is just one
7 of those activities.
8 Q But CP work --
9 A Yes, sir.
10 Q -- would not show up on the CPM
11 Maturing Document like this. It would show
12 up on a PM Plus document?
13 A A CP-related order, it will show up
14 either on a PM plus or a CPM. The only
15 differentiation is CPM means that it's a
16 DOT-regulated facility. That's all that
17 means.
18 Q Okay. I appreciate it.
19 A Yes, sir.
20 Q On your LinkedIn in page --
21 MS. CLORFEINE: I'm sorry. Before we
22 move, can we mark this as an exhibit?
23 MR. SHER: It has been marked as an
24 exhibit.
25 MS. CLORFEINE: Great. Sorry.
26 MR. SHER: The court reporter got me on
27 that early in the morning.
28 Q On your LinkedIn page, you have,

1 "Develop internal corrosion enhancement plan
2 for natural gas storage fields and one
3 production field." Am I correct in that?
4 A It sounds right, yes.
5 Q Can you tell me what an internal
6 corrosion enhancement plan for natural gas
7 storage fields would look like?
8 MR. DRAGNA: I'm sorry, Nick.
9 Corrosion and hearts?
10 MR. SHER: It's internal corrosion
11 enhancement plan.
12 MR. DRAGNA: Haunts? What's haunts?
13 MS. CLORFEINE: Enhance. Enhancement
14 plan.
15 MR. DRAGNA: Enhancement. I'm sorry.
16 Accent, accent. Sorry.
17 MR. SHER: I said the accent may come
18 up.
19 MR DRAGNA: It did. I've been
20 following you the whole day before that.
21 (Laughter.)
22 MS. SHER: Q So the internal corrosion
23 enhancement plan for natural gas fields, what
24 would it look like?
25 A The internal enhancement plan was
26 to just improve how we are looking at --
27 we're trying to improve. I made an extra
28 effort to enhance the way we're monitoring

1 and mitigating internal corrosion.
2 Q When did you develop or start
3 developing this internal corrosion
4 enhancement plan for natural gas storage
5 fields?
6 A I don't remember the exact date.
7 It's been several -- it was several years in
8 the making.
9 Q Would it have been after you took
10 your job in 2009 at the storage field?
11 A It was after, yes.
12 Q Okay. Great. Prior to you coming
13 on --
14 MR. DRAGNA: In 2009?
15 MR. SHER: In 2009.
16 Q Prior to you changing to your 2009
17 job, were there prior internal corrosion
18 plans that you based your enhancement on?
19 A Yes.
20 Q Do you know what those were called?
21 A Yes. We have a gas standard. And
22 I don't remember that there is a gas standard
23 on internal corrosion management. I forgot
24 the name. I just don't remember.
25 Q That's fine. Any other plans that
26 you would have based your enhancement upon?
27 MR. DRAGNA: Are we talking above
28 ground or below ground?

1 MR. SHER: This is all below ground.
2 MR. DRAGNA: Below ground.
3 THE WITNESS: Below ground?
4 MR. SHER: Q Mh-hm.
5 A I have no idea.
6 Q When you're talking about an
7 internal corrosion enhancement plan, that is
8 specifically for above-ground facilities?
9 A My principal effort was the
10 above-ground facilities, yes. Because -- and
11 that's where my training was. It was the
12 internal corrosion control for pipelines.
13 Q Okay.
14 A So, yes. It's just the surface
15 pipelines.
16 Q And as you were explaining earlier,
17 that would address potentially water pooling
18 or liquid pooling in a horizontal pipeline?
19 A Yes. Or a vessel. But they were
20 all what we would consider, you know, surface
21 facilities.
22 Q As far as -- again, based on our
23 discussion earlier where water probably
24 wouldn't pool on a vertical pipe. Are you
25 aware, did the internal corrosion enhancement
26 plan address any down-well facilities?
27 A Our focused effort was on the
28 piping system and all the associated

1 pertinences with that pipeline. The
2 down-hole was not the focus of our
3 concentration.
4 Q Now, the next set of questions will
5 be specifically around SS-25 and the leak.
6 A Okay.
7 Q Okay. When did you first become
8 aware of the leak?
9 A I think on or about that day. I
10 heard we had an issue up there.
11 Q And what did you do if anything?
12 A Probably asked some questions, you
13 know. I don't remember what I did, you know.
14 Q Was Jim Mansdorfer your direct
15 report at that time?
16 A No, sir. Jim was never -- I never
17 reported to Jim.
18 Q Was Amy Kitson your direct report
19 at that time? This is 2015, October 23rd.
20 A I don't really remember. I don't
21 remember who it was.]
22 Q Okay.
23 A I don't remember who it was.
24 Q Do you remember offering any
25 advice, based on your experience with
26 cathodic protection, as to what may have
27 occurred?
28 A No, I offer no advice, no.

1 Q Did anyone from the company come
2 ask you whether you had any ideas as to what
3 occurred?
4 A No. I mean, because to this date,
5 I still don't know what happened. I mean, I
6 know it separated or had a hole. That's all,
7 essentially, what I know.
8 Q Okay. And why would it -- you
9 know, have you thought about why it would
10 have a hole?
11 A Yeah. But, I mean, my speculation
12 is worth as much as the guy in the street, I
13 suppose.
14 Q I would beg to differ. You are,
15 based on your experience for 37-odd years
16 doing this kind of work, you are a subject
17 matter expert in cathodic protection. And
18 so --
19 MR. DRAGNA: I think to be fair,
20 Nicholas, most of that time was spent in
21 appliances, so --
22 THE WITNESS: Yeah. 19 years, or so,
23 in cathodic protection.
24 MR. SHER: Okay. Okay.
25 Q Then I was trying to give you the
26 benefit of the doubt. Let’s drop it to ten
27 years of experience --
28 A Okay.

1 Q Based on what you've seen as a
2 cathodic protection expert, have you any
3 ideas as to what may have caused a hole in
4 the pipe at SS25?
5 A I have speculated.
6 Q Okay. If you don't mind --
7 A But, you know I --
8 Q What were your thoughts?
9 A I don't really want to expose
10 myself based on, you know, what I think.
11 Q I'm not trying to expose you here.
12 I'm just trying to see, based on your
13 experience, what you think may have occurred.
14 I'm not trying to trip you up.
15 MR. DRAGNA: Well, to be fair, you're
16 asking for his opinion.
17 MR. SHER: I am.
18 MR. DRAGNA: But he is a not here as an
19 expert. He's here as --
20 MR. SHER: But he is a cathodic
21 protection expert. So, with that in mind,
22 I'm asking him if he has any ideas as to what
23 occurred?
24 MR. DRAGNA: Well, you're still asking
25 him to speculate. And he's not an expert
26 with respect to down-hole, he's is --
27 MR. SHER: And that's great, Jim. And,
28 ultimately, I want him to answer the

1 question.
2 MR. DRAGNA: I just want it to be fair
3 for the record he did make clear he wasn't an
4 expert in down-hole.
5 MR. SHER: Absolutely.
6 MR. DRAGNA: All right.
7 MR. SHER: Q But if you can tell me
8 what thoughts you had about what could have
9 caused a hole in SS25, I would really
10 appreciate it.
11 A I can speculate, but there could be
12 a number of things whenever a well fails. I
13 -- and I --
14 Q Jim, I -- sorry, Mr. Selga --
15 MR. DRAGNA: I would be happy to answer
16 the question.
17 (Laughter.)
18 MR. SHER: Q I appreciate that you
19 have a contract with SoCalGas currently. And
20 I appreciate that the question may be
21 difficult for you to answer.
22 A Sir, my contract with the gas
23 company has nothing to do with that question.
24 Q Okay.
25 A I mean, I'm going to tell you the
26 straight scoop no matter what, so --
27 Q Great.
28 A I can find employment elsewhere.

1 Q You said you have speculated as to
2 what occurred, what caused the hole. So I'm
3 just trying to find out what you thought.
4 A Okay. So, I mean, there could be a
5 multiple -- there could be multiple. It
6 could be a mechanical, it could be a material
7 failure, it could be a corrosion failure, it
8 could be internal failure --
9 Q Okay.
10 A It could be tectonic.
11 Q Okay. If it was corrosion that
12 caused the failure, what do you think could
13 have helped cause that corrosion at whatever
14 the depth of the hole was?
15 MR. DRAGNA: Again, Nicholas, to be
16 fair, you're just asking him for expert
17 opinion. And he's not here as an expert to
18 provide opinion. So, just to be fair...
19 MR. SHER: Appreciate it. It’s on the
20 record.
21 Q If you don't mind answering the
22 question?
23 A Could you ask it again?
24 Q Yes. So, if we assume corrosion
25 caused the hole, and I think the hole is
26 1,000 feet or shallower, what would cause
27 corrosion at a thousand feet in the earth?
28 A What would cause corrosion? Well,

1 number one, I don't know what happened there.
2 I really don't. I don't know what happened.
3 So there's two parts to my answer. I don't
4 know what happened. And, number two, CP may
5 or may not be effective at whatever or
6 wherever it was with respect to its place in
7 the ground. It may or may not be effective.
8 Q Understood. But what would cause
9 corrosion at a thousand feet below ground on
10 a metal pipe?
11 A Well, generally speaking, I'm not
12 being specific to that well or anything --
13 Q Sure.
14 A You have a pipe that's exposed to
15 the environment, to the soil, and there's
16 certainly a potential for corrosion.
17 Q Would cathodic protection work or
18 be hindered if there was water present?
19 MR. DRAGNA: Do you mean generally or
20 SS25?
21 MR. SHER: Q Just down-well, we can go
22 SS25.
23 A I don't -- wait, I'm confused now
24 about your --
25 Q So how does water, you know,
26 interact with cathodic protection?
27 A Water, just speaking in general
28 terms, water by itself in terms of external

1 corrosion, it may or may not -- well, let me
2 say this, the presence of water doesn't
3 negate the effectiveness, necessarily, of
4 cathodic protection nor does it enhance,
5 either way. So, typically, when there's more
6 moisture, there's a greater likelihood of
7 corrosion. Because now you have a lower
8 conductivity environment that the pipe exists
9 in.
10 Q But CP can't help protect against
11 moisture affecting corrosion?
12 A Now we're talking in general terms
13 or.
14 Q In general terms, but below ground?
15 A Okay. A well casing?
16 Q Mm-hm.
17 A All right. So your question was
18 what again?
19 Q So I'm trying to figure out whether
20 or not cathodic protection can help mitigate
21 the impacts of water causing corrosion
22 down-well?
23 A Is it possible?
24 Q Sure.
25 A I would say it’s possible. But,
26 however, I would qualify that and say it may
27 or may not be effective. But it’s certainly
28 possible.

1 Q Okay. So still down-well and now
2 not water, but we've got sand or just the
3 soil makeup -- the geological makeup, how
4 does that affect cathodic protection?
5 A And I'm talking in general terms,
6 I'm talking general -- without specificity to
7 a well casing. I'm talking about a pipe and
8 a soil. If you have just similar soils, in
9 other words, you had a clay and then you had
10 a more sandy spot, that could create -- it
11 has the potential to create a corrosion cell.
12 Q So you mentioned earlier that
13 Goleta has shallow geology; is that correct?
14 A Shallower in comparison to, like,
15 Aliso --
16 MR. DRAGNA: Sorry. Sorry. When you
17 say "shallow," you mean the wells are more
18 shallow?
19 THE WITNESS: Shallower. Depth, yes.
20 MR. DRAGNA: Okay.
21 MR. SHER: Q And correct me if I'm
22 wrong, but all the wells at Goleta have
23 cathodic protection?
24 A Yes.
25 Q And is that because of the soil
26 type at Goleta? What's the difference
27 between Goleta and Aliso with regard to
28 cathodic protection and wells?

A I was not there to establish the necessity for cathodic protection. That was done sometime before me at both fields. So --

Q Okay. But we talked earlier in the 1990s, the Schlumberger tool was used at Aliso; is that correct?

A It's -- no, I'm not sure. I don't remember when that tool was run on that well.

Q It was run before you started your job in 2009; correct?

A Yes, it was.

Q Okay. And you went back, though, to read that report, correct, on the values produced by that tool?

A I looked back on it, yes, once I found it.

Q Which is reasonable.

A Yeah.

Q So you didn't, though, look back to see or speak to anyone as to why Goleta had all these cathodic protection devices on the wells?

A No, I did. I looked through the records and wanted to -- part of my job is if -- like, for instance, if Goleta and Honor Rancho if they had CP on the wells, which they did, I would want to follow -- kind of

1 mimic that pattern for that particular field.
2 So if CP was effective for a particular well
3 casing, then I can use that to, you know --
4 like, in other words, if it took one amp or
5 four amps to protect a well casing, I can say
6 "Well, it's in a similar situation," I can
7 use that same one to four amps to apply to
8 another well casing.
9 Q At the same facility?
10 A Yes.
11 Q Okay. So understanding that you
12 were not there when the CP was put in place
13 on the wells in Goleta, based on your review
14 of the Goleta field, why were CP devices put
15 on wells at Goleta?
16 A Of course. I -- we're talking
17 about something historical, probably long
18 before I knew how to spell cathodic
19 protection.
20 So your question was what again?
21 Q Well, I'm -- you've demonstrated
22 that -- and, for me, happily demonstrated
23 that when you've taken a new role, you've
24 gone back to review historical data, I'm
25 assuming, so that you can do as good a job
26 going forward as responsible. And I think
27 you said in response to a question that you
28 reviewed data at Goleta as to why the CP

1 devices were put in place; is that correct?
2 A Yes.
3 Q Okay. So I'm asking you why were
4 they put in place?
5 A Oh, they ran a tool. And the tool
6 indicated that CP was effective for -- they
7 did a sampling -- I forget which wells -- but
8 they did a sampling, and they determined that
9 CP was effective.
10 Q Great. Which tool did they use?
11 A It was some form of a -- what is
12 known today, as a CPET, cathodic protection
13 profile tool is what they called it back
14 then.
15 Q Are there cathodic protection tools
16 available today?
17 A To my knowledge, the only tool that
18 I know with certainty is one tool by
19 Schlumberger. And there was rumors of
20 another tool, but no one has seen that.
21 Q Okay.
22 A And no one has seen the tool.
23 Q And I appreciate the offer to
24 partner with you on --
25 (Crosstalk.)
26 MR. SHER: Q But how much does the
27 Schlumberger tool cost?
28 A I've heard different numbers and,

1 of course, it’s supply and demand. I'm sure
2 Schlumberger will use that to their
3 advantage.
4 Q By the way, I don't mean to rent.
5 How much did it cost to build?
6 A Oh, I have no idea, sir.
7 Q Okay. And then so how -- if you're
8 seeking investors to build a tool to
9 replicate what Schlumberger's tool does, how
10 much money do you need?
11 A I have no idea.
12 Q Is it --
13 A I'm not into is that business. I
14 don't know how --
15 Q Oh, so you weren't being serious
16 when you said if someone wanted to invest
17 with you?
18 A I was using exaggeration to prove a
19 point.
20 Q Okay. But are we talking about a
21 tool that costs a hundred thousand dollars or
22 $10 million?
23 A Oh, I don't think it’s in the tens
24 of millions or even in the millions. It
25 seems to be simplistic in its own, just by
26 virtue of what it is.
27 Q What is the budget for your group?
28 Or what was the budget for your group in the

1 years 2009 to 2017?
2 A Okay. I wasn't responsible for
3 budget. So my tech services manager was
4 responsible for what my budget was.
5 Q Okay. But you have no idea how
6 much budge you had?
7 A Well, I knew -- the capital budget,
8 I had some idea because I provided him with
9 input.
10 Q So what was the capital budget? In
11 a given year between 2009 and 2017?
12 A It differed because we were
13 enhancing our internal corrosion effort. It
14 increased to our capital budget -- it was
15 somewhere around 350,000.
16 Q Okay. And would a tool cost 350?
17 A Are you talking about the --
18 Q Schlumberger, CPET?
19 MR. DRAGNA: I think he already said he
20 had no idea.
21 THE WITNESS: Yeah. Really, I have no
22 idea.
23 MR. SHER: Q Um --
24 A I wish I owned one. I'll put it to
25 you that way.
26 Q Well, I do think it’s a good
27 business. Makes a lot of sense.
28 A Let’s go.

1 Q Okay. So when you would go to Mr.
2 Mansdorfer -- and I don't know how many times
3 you went to Jim to say, "I'm offering to put
4 CP on all the wells at Aliso," do you recall
5 how many times you offered to put CP on all
6 the wells at Aliso?
7 MR. DRAGNA: I think he testified two
8 or three was his testimony.
9 MS. CLORFEINE: Two or three times.
10 Yeah.
11 MR. SHER: Q And these were two or
12 three distinct times you made that offer.
13 A I'm just -- I'm estimating.
14 Q I'm trying just to clarify whether
15 it was one instance and you offered, like,
16 three times for the one instance, or you
17 offered in 2009, 2013, 2016?
18 A I would say by the time Jim was
19 there and I was there in 2009, maybe three
20 occasions when I made that offer.
21 Q And that would be three separate
22 occasions?
23 A Yes.
24 Q Okay. Thank you.
25 Did you feel like you were being
26 listened to as the CP expert?
27 A Yes, I think so.
28 MR. DRAGNA: When you talk about

1 expert, are you talking about aboveground or
2 below ground?
3 MR. SHER: Well, cathodic protection on
4 all wells that's the context?
5 MR. DRAGNA: On wells?
6 MR. SHER: That's the context; right?
7 MR. DRAGNA: Well, I'm asking you
8 because --
9 (Crosstalk.)
10 MR. SHER: Jim, pay attention please.
11 You're interrupting. If you paid attention,
12 the question was about CP on wells.
13 MR. DRAGNA: That's not true. You
14 didn't say that. But go ahead, with that
15 clarification.
16 THE WITNESS: So your question was
17 again? I'm sorry.
18 MR. SHER: Q So, again, with regards
19 to your offer to put CP on wells three times
20 the answer was no; correct?
21 A Now, saying "all wells," I just
22 want to --
23 Q At Aliso?
24 A I offered as a general statement,
25 "Would you like for me to put CP on the well
26 casings here?"
27 Q Great.
28 A At Aliso.

Q Great. And you did that three distinct times, as far as you can recall?

A As far as I can recall, yes. And they were all, you know, in conversation.

Q And each time, though, the answer was "no"?

A That is correct.

Q Okay. So, just, as the CP expert, I think you were the CP expert at Aliso, at least, or at SoCalGas during this time period?

A Okay. So -- and this is where I want to make my distinction clear, is that I'm a cathodic protection person. My primary expertise is on those horizontal surface facilities. That's a relatively very easy, relatively speaking, it’s a well-defined, well-regulated industry, that portion. But for anything down-hole, that is much more -- it’s -- there's so many other elements involved. The integrity of that well casing, that doesn't -- I'm only a contributor. I'm a cathodic protector. The integrity of that well is the -- there are experts that consider everything. I only consider a portion of that.

Q So who would you recommend we talk to at SoCalGas, then, to get a better

1 understanding as to the integrity of the
2 well.
3 MR. DRAGNA: I'm sorry. Are you
4 talking about the well SS25? Or any well at
5 Aliso?
6 MR. SHER: Q Just down-well?
7 A I would say someone from the
8 underground storage group.
9 Q Okay. You left in 2017; correct?
10 A Yes, sir.
11 Q And you still currently work for
12 SoCalGas, so you're at Aliso on a regular
13 basis?
14 A No, I have not been to Aliso -- no,
15 I have not been to Aliso since I've been
16 back.
17 Q So your communication is just via
18 email?
19 A Principally. But my job -- I'm in
20 pipeline integrity now.
21 Q Okay.
22 A I do have some task in storage.
23 But I've not been to -- the only place I've
24 been to is the tower or Chatsworth.
25 Q Okay. So somebody in charge of
26 underground storage would have a better
27 understanding of well integrity, because you
28 only do one piece, which is CP; correct?

1 A That is correct.
2 Q Okay. So, again, with regards to
3 -- well I'll change it.
4 You've stated that your main
5 expertise is in aboveground cathodic
6 protection; correct?
7 A Yes, that's -- yes.
8 Q Okay. And from 2009 to 2017, were
9 you the subject matter expert on CP
10 aboveground at SoCalGas?
11 A For storage?
12 Q For storage; correct?
13 A Yes.
14 Q Was there anybody -- was there any
15 CP expert at Southern California Gas for
16 down-well during your time at the Southern
17 California Gas Company?
18 A For cathodic protection?
19 Q Cathodic protection.
20 A To my knowledge, no.
21 Q Okay. So cathodic protection is
22 your -- was your shop between 2009 and 2017,
23 and if it addressed any down-well stuff, it
24 came through your shop?
25 A I just want to make -- make sure of
26 the distinction. With all the surface
27 facilities, whether they be, no matter who
28 they were regulated by, I just -- it was

1 incumbent upon me to ensure that that was
2 getting done. The down-hole stuff, my role
3 was that of a technical role. The way
4 someone made decisions, that was beyond my
5 scope. I would say, look -- I would simply
6 put it, "Do you want me to put CP on the
7 wells?"
8 Q Okay. So, with that, when you
9 offered to put CP on the wells at Aliso, is
10 that surface or subsurface?
11 A Well, by definition, I think you
12 said the wells; right?
13 Q I did. Well, you said you offered
14 to put CP on the wells at Aliso. So that, by
15 definition, is down-well --
16 A Yes.
17 Q Or that would be the intent?
18 A Yes.
19 Q Okay. Great.
20 And you are the cathodic protection
21 expert at Southern California Gas; correct?
22 A For -- in storage, yes. At that
23 time, yes.
24 Q In storage. Okay.
25 So when the cathodic protection
26 expert goes to a Jim Mansdorfer, who's
27 underground gas storage; is that correct?
28 A Yes, sir.

1 Q And you say to Mr. Mansdorfer, I'm
2 willing to put -- or how do you say it?
3 A I would say something like, "Hey,
4 Jim, do you want me to put CP on those wells
5 over there?"
6 Q And -- but the answer you got all
7 three times was "no"; correct?
8 A Correct.
9 Q How does that make you feel? I
10 mean, do you feel valued?
11 A I -- I -- I mean --
12 Q You're a CP nerd.
13 A Yeah. (Laughter.)
14 I realize the value in the
15 underground storage group, their expertise.
16 So I contribute, or I'm willing to
17 contribute, by saying "Look, do you want CP
18 on these wells?" And it’s up to them to
19 decide, you know, based on their expertise on
20 if I should apply CP or not.
21 Q But as far as you know, they do not
22 have a CP expert?
23 MR. DRAGNA: CP expert on aboveground
24 pipes or below ground?
25 MR. SHER: Jim, please. This is all
26 below ground, man --
27 MR. DRAGNA: He's made it clear he's
28 not an expert on CP below ground.

1 MR. SHER: But I'm asking him if he's
2 aware that underground storage has a CP
3 expert?
4 MR. DRAGNA: Okay.
5 THE WITNESS: Well, no. I mean, I --
6 and, again, I want to differentiate. CP is
7 one form of corrosion control. It's one form
8 of the total integrity management of whatever
9 it is above- or below-ground. So in that
10 respect, yeah, I was the CP guy. But, also,
11 again, I want to say that these guys have
12 quite a bit of training, expertise, education
13 that, simply, I just don't have the full
14 scope like what they would have.
15 Like, for instance, you know, if I
16 take my car the get the oil changed, I don't
17 expect these guys to be the expert on the
18 valves or the pistons or whatever. I expect
19 them to address only change the oil. Give me
20 the proper --
21 MR. SHER: Q But the analogy works
22 better for me this way. I go to the
23 mechanic, and you're the oil change dude, and
24 there's another dude who owns the shop and
25 you're telling the owner of the shop, "Needs
26 an oil change," and the owner of the shop
27 says, "No."
28 A So, I mean, respectfully, I -- I

1 would have -- I would be hard pressed to
2 challenge a Jim Mansdorfer or his type on
3 their assessment. And I don't know all the
4 things that they are considering. I mean,
5 I'm only -- I would be speculating as to his
6 rationale.
7 Q Do you voice your -- well --
8 After Jim said no, did you ask
9 anybody else whether or not CP would be a
10 good idea on the wells at Aliso?
11 A I don't know of any specific
12 instances. However, I often -- sometimes I
13 will put out emails, like, saying, you know,
14 just general corrosion stuff. So I know in
15 my past, because in my previous role I put
16 out CP tips, you know --
17 Q Mm-hm.
18 A And something where I feel like,
19 you know, that someone may benefit from it.
20 So that may have occurred. I can't speak
21 specifically that I've done that.
22 Q I'm going to -- I appreciate what
23 you do. You really seem to be someone who
24 cares about this and passes that information
25 on.
26 A Yes, sir.
27 Q So I appreciate it.
28 A Thank you.

1 Q So --
2 MR. DRAGNA: We've been going about an
3 hour; can we take a break?
4 THE WITNESS: Yeah.
5 MR. SHER: Yes, let's go off the
6 record.
7 (Off the record.)
8 MR. SHER: We're going to be on the
9 record.
10 THE WITNESS: I like that
11 off-the-record better stuff, that's more fun.
12 DIRECT EXAMINATION
13 BY MR. HOLTER:
14 Q All right, Mr. Selga.
15 I'm Randy Holter. I'm the Senior
16 Utility Engineer Specialist for the Gas
17 Safety and Reliability branch. What I would
18 like to do is visit some of the topics
19 discussed earlier. So I don't want to
20 vaguely attest to your prior statements. I'm
21 looking more to just get clarification and
22 fill in more information for us to understand
23 here.
24 So if we can go to the corrosion --
25 these are discussions that came up earlier,
26 corrosion, corrosion protection, metal loss
27 prevention, cathodic protection. You've done
28 a great job explaining where you are in your

1 expertise on that. There's a number of
2 subcategories you talked about.
3 Is there some more information you
4 can give us about your subcategory expertise
5 on these topics? In other words, if you're
6 out in the field and you're offering your
7 expertise, can you state what your
8 understanding is, your parameters of
9 expertise, from 2009 to 2017 in this role
10 with these subjects? Corrosion, corrosion
11 protection, metal loss prevention, cathodic
12 protection, as far as you understand your
13 role with the company?
14 A Was --
15 Q SoCalGas?
16 A Is there a particular question or
17 some --
18 Q Okay. So we kind of left off on
19 this.
20 Did you understand that you were
21 the expert for these? Corrosion, corrosion
22 protection, metal loss prevention, cathodic
23 protection?
24 MR. DRAGNA: Can we just take these one
25 at a time? So maybe ask them one at a time?
26 MR. HOLTER: Sure.
27 Q Take corrosion; as far as the
28 knowledge of corrosion, do you consider

1 yourself the expert for SoCalGas?
2 A Not the expert, no, not in
3 corrosion control in the general terms. No,
4 I'm one of a few.
5 Q Okay. Are you able to list the
6 others -- individuals who were also experts
7 for the company during these years?
8 MR. DRAGNA: In corrosion?
9 MR. HOLTER: Q In corrosion,
10 specifically?
11 A Okay. So this I -- this I can say,
12 is that there are a number of people across
13 the gas company that address corrosion
14 issues, whether it be atmospheric internal,
15 external corrosion. So many -- like, an
16 engineer probably took a metallurgy course
17 and is aware of -- in their design if they
18 are doing design for a pipeline or tank, or
19 whatever it is, that they have some knowledge
20 or training in corrosion. So --
21 Q So you --
22 A There's a number of people that
23 have a little piece of corrosion in them.
24 Q So let me help with -- as far as --
25 let’s stick with a subsurface, that would
26 mean horizontal transmission and both, as
27 we're talking here, down-hole well. Are
28 there names of associates that you worked

1 with during 2009 and 2017 that were also
2 either collaborating, or you're seeking their
3 consultation for expert advice, working with
4 do you have their names?
5 MR. DRAGNA: Can we just break it down
6 one question at a time? There were about
7 four questions --
8 MR. HOLTER: I was giving examples
9 of --
10 MR. DRAGNA: There's --
11 THE REPORTER: One at a time.
12 (Crosstalk.)
13 MR. HOLTER: Q Are you able to provide
14 names of other experts that you worked with
15 during that time period on corrosion?
16 A In cathodic protection?
17 Q Down-hole?
18 A Down-hole?
19 Q Down-hole and subsurface?
20 MR. DRAGNA: Can we take this one at a
21 time?
22 THE WITNESS: Yeah. I'll start with
23 subsurface. I mean, I've got peers in the
24 transmission group and in the distribution
25 group.
26 MR. HOLTER: Okay.
27 Q Are you able to provide their
28 names?

1 A I mean, it -- things were moving
2 around, so it was pretty dynamic back then.
3 Do you want to know back then, or? Because I
4 mean, there's -- not that there's a lot of
5 movement in the CP group, but there's enough
6 to where I can't recount where everybody was
7 at that time.]
8 Q Did -- did these individuals report
9 to you or did you have a team working for
10 you, of experts?
11 A No. I had a represented employee
12 that was a cathodic protection employee, and
13 he did -- he's actually the one that did the
14 hands-on work.
15 Q Okay. Would he be your level of
16 expertise and responsibility in the company?
17 A No, typically -- typically, just by
18 virtue of the fact that I grew in
19 responsibility and expertise with my years.
20 So typically, the represented person --
21 obviously, they're trained in what they do;
22 but -- but, as a supervisor, usually, I'm a
23 step ahead, as it were.
24 Q Okay. So would you say there's
25 someone who was your equivalent in experience
26 and knowledge you worked with during that
27 time of 2009, 2017 in subsurface cathodic
28 protection?

A Well, when you say, "subsurface," can you define that for me?

Q Transmission.

A Oh, yeah. Yeah. I had peers in transmission, in the transmission group, they were my peers in their group, and then as well as distribution.

Q And then did you have peers with the same experience and knowledge in down-hole well cathodic protection?

A I -- I -- there's only one other guy that I esteem and look to and I would collaborate, as it were, in thought.

Q Uh-huh.

A CP is kind of collaborative, but then it's also individual.

Q Sure. Yeah.

A So I don't know if I answered your question.

Q So you have one other guy, individual, I should say. May you provide that individual's name and -- and title?

A Oh, sure. That would be Steve Bean.

Q Steve Bean. Okay.

A Yeah. Steve's a transmission --

Q How long was that that you worked with him?

A Oh, I don't directly work -- I've never worked directly with him; but, in our community of CP guys and gals, he's a guy that I've known for a long time.

Q And again, to clarify --

A Uh-huh.

Q -- he would be your peer in knowledge and expertise in down-hole, as much as there was, for The Gas Company?

A So -- and in the -- in CP, people have -- again, when someone gets training in CP or training, formal or otherwise, they get the basic principles, and then the application of those principles -- some people may specialize in certain applications; like I've spent more time on tanks and vessels than anybody in pipeline. Right?

Q Uh-huh. Uh-huh.

A Just by virtue of that's where a lot of my focus was concentrated on. So I'm not sure if I'm answering your question, but sometimes I'll ask advice from folks on some certain things.

Q That -- I appreciate all the breadth of knowledge.

A Uh-huh.

Q I mean I'm actually learning a lot

1 about all your knowledge. What I'm
2 specifically talking about is down-hole well
3 expertise regarding these subject matters,
4 corrosion. So I'm specifically looking for
5 other individuals you collaborated with
6 specifically for down-hole well casing sub,
7 you know, surface casing, annulus production
8 casing, those -- those experts in SoCalGas
9 you collaborated or looked to for expert
10 input and collaboration.
11 A I -- I don't really think there is
12 any -- where I collaborated in respect to
13 that with anybody that was in place at that
14 time. I -- I've spoken to others in the
15 industry, but that's -- that's where it's
16 limited.
17 Q Uh-huh. So Steve Bean, to be
18 clear, did or did not collaborate with you or
19 was -- was or was not your peer? Can you
20 clarify?
21 A Well, in cathodic --
22 Q In down-hole well --
23 A No.
24 Q -- in 2009, 2017.
25 A No. I wouldn't -- I wouldn't --
26 Steve may have some knowledge, and I have
27 a -- a high respect for him in regards to
28 cathodic protection. I don't know how much

1 he knows about down-hole. I -- I can't
2 speak, with any specificity. I know he's a
3 pretty sharp guy.
4 Q Yes. I appreciate it. Okay.
5 Considering that, moving to the
6 topics we've covered regarding your
7 approaching Mr. Mansdorfer --
8 A Uh-huh.
9 Q -- I believe we talked about three
10 specific times you remember. Is that
11 correct?
12 And did you approach him alone, as
13 the subject matter expert in cathodic
14 protection, and have a dialogue, or what --
15 however you did it with him? Did you
16 approach him individually, and then the two
17 of you discussed whether or not to --
18 A Well, again, I want to clarify. I
19 have -- I have my -- my role is a cathodic
20 protector, and whenever I ask the question,
21 "Would you like CP on some well casings in
22 this instance," my role is -- is limited to
23 that. Someone else, who has a greater
24 understanding of the integrity of the well
25 and what it takes to maintain that well,
26 they're -- they are the ones that make that
27 decision.
28 Q Okay.

1 A So whenever someone says they want
2 to put CP on a well, then I take it over from
3 there. The handoff is -- goes to me, and
4 then I execute.
5 Q So someone has made a decision to
6 put or not put it on, specifically Aliso
7 Canyon now we're speaking, and you're saying
8 they come to you with a request to do what?
9 What are they asking you to do, design
10 something or put a plan together? How does
11 that work?
12 MR. DRAGNA: You mean in the abstract
13 or specifically an example?
14 MR. HOLTER: Specifically with Aliso
15 Canyon.
16 THE WITNESS: Oh, what type of
17 facilities? Like --
18 MR. HOLTER: Q A down -- a down-hole
19 well casing or surface casing plan for CP.
20 A To my knowledge, I don't recall. I
21 made an offer to the two wells, Porter 50, B
22 and C, excuse me, specifically, and that
23 decision was made by underground storage and
24 the field manager.
25 Q And who were those individuals?
26 When you say that term, who were the
27 individuals?
28 A At the time, the manager of the

1 field was Glen LaFevers, and the underground
2 storage manager was Jim Mansdorfer.
3 Q Jim Mansdorfer?
4 A Yes, sir. Excuse me. Time for the
5 heart candy.
6 Q To the best of your recollection,
7 can you tell us what the -- maybe the year
8 that these 50 A and B -- these wells were
9 installed, the wells themselves?
10 A The actual well themselves, I -- I
11 don't remember. I don't remember. If I had
12 my old emails and stuff like that -- but, I
13 don't have anything.
14 Q To the best of your recollection,
15 can you tell me when you installed the CP
16 protection system on those two -- on --
17 A I don't remember.
18 Q Was it within the last five years?
19 A All I -- I mean what I do know, it
20 was before two -- it was before SS-25.
21 That's all -- that's the only thing I'd say
22 with certainty.
23 Q Okay. So you remember that it --
24 the CP plan -- I'm sorry, system --
25 A Uh-huh.
26 Q I'm clarifying. I'm not telling
27 you.
28 A Uh-huh.

1 Q Are you stating that it was done
2 before October of 2015, both 50 A and 50 B
3 were installed CP packages?
4 A It was 50 B and C.
5 Q 50 B and C. Okay.
6 A Yeah. Yeah, I did that before --
7 before October 2015.
8 Q Was it the same year before?
9 A I'm really stretching my memory
10 banks. I want to say -- it took me years to
11 remember my wife's birthday. I know it now,
12 but it took me a few years.
13 Q I appreciate that.
14 MR. DRAGNA: I just want to advise you
15 to take that off the transcript; just a
16 suggestion.
17 MS. CLORFEINE: That's right.
18 THE WITNESS: Well, I know it now.
19 MR. DRAGNA: That's good.
20 MR. HOLTER: Q Well, considering that
21 we can put together a data request for that,
22 how would you recommend we ask for that
23 information, for when the CP was installed in
24 those two wells?
25 MR. SHER: I think you stated --
26 MR. DRAGNA: You just ask.
27 MR. SHER: You stated it quite well,
28 Randy.

THE WITNESS: Yeah.

MR. HOLTER: All right.

THE WITNESS: Yeah, you guys have the authority. You can do anything you want. Right?

MR. HOLTER: Q Good enough. We'll move on. I appreciate it.

A Yeah.

Q So let's visit another topic, for clarification.

We talked about the effectiveness, or no, whether or not a CP package may or may not be effective --

A Uh-huh.

Q -- a certain distance down. That was a subject that we were talking about earlier. And I -- and I -- if I understood you right, there is no specific like template, so to speak, saying it's going to always be effective down this far. So let's talk about a subjective or your experience.

What's your experience of what can be counted on as far as the effectiveness of a down-hole CP system on specifically a well, generically, no specific location, casing, surface casing, are the two parameters for as far as the physical structure?

MR. DRAGNA: Do you mean what depth?

1 MR. HOLTER: Yeah.
2 Q How -- how many feet down is your
3 expertise on this? As it is, how effective
4 is it down -- how far down?
5 A One may use different means to --
6 and I -- I think I'm speculating on this.
7 Q Fair enough. You've already
8 clarified it's not an exact science, at this
9 point.
10 A So I'm not sure if I could --
11 excuse me. One second, please. Could you --
12 Q No. Go ahead. Yeah.
13 MR. GRUEN: Let's go off the record for
14 a second.
15 (Off the record.)
16 MR. GRUEN: Back on the record.
17 MR. HOLTER: Q Are you good with the
18 question as it is?
19 A Oh, could you restate it? I'm
20 sorry. I lost focus.
21 Q We're talking about the -- your
22 understanding, based on your experience when
23 you left in 2015, the -- the effectiveness,
24 the depth at which a CP package is effective
25 on a surface case in a well.
26 A Okay. If I may, I need to -- I
27 just need to know, surface casing, you're not
28 talking about production casing?

1 Q Both of them are in play on your
2 answer, so I appreciate it if you would at
3 least distinguish between the two.
4 A Okay. So just for the record, a
5 surface casing does not carry product. Okay?
6 A production casing does.
7 Q That's correct.
8 A So -- and again -- and I'm sorry.
9 I'm not trying to be rude, but could you --
10 could you ask that question again?
11 Q Okay. Let's stick with surface
12 casing.
13 A Okay.
14 Q If you were to put and -- and based
15 on your experience and knowledge, apply CP to
16 a surface casing, what depth are you
17 comfortable with the effectiveness of that
18 reaching in the well?
19 A I am not confident there's any way
20 to determine the effectiveness on a surface
21 casing.
22 Q Okay. And then, if I may repeat
23 fairly closely the exact same question for a
24 production casing --
25 A Uh-huh.
26 Q -- what is the effectiveness depth
27 at which you would be comfortable designing
28 CP for annulus production casing?

A Okay. I'm having a problem with the word annulus. But, in a production casing --

Q We'll stick with production; same thing.

A Okay. They're -- it's -- it's -- let me just say, there's -- there's a lot of different variables involved in that. So it's -- it's difficult to say every time that this is true. Sometimes you may protect a well casing the entire length, sometimes you may not. So I'm -- I -- you know, I -- it -- I think I would be theorizing.

Q Uh-huh.

A Each well, each situation, has its own environment. Each well has different construction, different type of lithology. So I -- I can't -- you know, I -- anything I say, it's just general terms.

Q I hear you. Would it be fair to say that you're guarded to say that, generally, because each well is so unique, and each place that it's located is so unique, there's a number of parameters that you have to look at, in order to design it? Is that fair to say?

A Designing a cathodic protection --

Q Yes.

1 A -- system?
2 Q Uh-huh.
3 A Designing the cathodic protection
4 system is -- that's one thing; but,
5 quantifying if it's necessary or effective,
6 that's another thing.
7 Q I -- uh-huh.
8 A So I mean I can design a cathodic
9 protection system to protect this steel that
10 you have in contact with the soil here.
11 Q Uh-huh.
12 A Do I know that it's effective? Not
13 necessarily. I mean I -- I can put an anode
14 on it, or a few anodes. So -- but I don't
15 know if it's going to be effective. So I
16 don't -- I'm not sure if I answered your
17 question.
18 Q No. I appreciate you
19 distinguishing between those two. So what
20 we'll do is -- I -- this is going to help me
21 with the next question --
22 A Okay.
23 Q -- which is let's talk about those
24 two wells that you did --
25 A Uh-huh.
26 Q -- prior to 2015, install CP
27 systems. Let's talk about, specifically,
28 design of those two wells. I just heard

1 you -- if I'm not mistaken, a number of
2 parameters you would consider, which is a
3 number of things we've talked about prior,
4 you know, anywhere from the soil to the type
5 of subsurface conditions to the pipe --
6 piping facility itself.
7 For 50 and 50 A, are you -- do
8 you -- can you -- may you -- may you recall
9 the depth at which you -- okay -- designed
10 this system so that you would want to protect
11 it to a certain depth?
12 MS. CLORFEINE: If I could just
13 clarify, I think it's 50 B and C. You said,
14 "A and B."
15 THE WITNESS: Yeah.
16 MR. HOLTER: I keep saying that.
17 THE WITNESS: Yeah.
18 MR. HOLTER: I'm so sorry, 50 B and C.
19 I just feel like "A" is -- feels left out.
20 THE WITNESS: I know. It's --
21 MR. HOLTER: Q And it's "P," too.
22 Right? It's Porter? Porter 50 --
23 A Yeah --
24 Q -- B and C?
25 A -- I think it's Porter 50 B, yes.
26 Q I'll be clear. I'm going to write
27 it down, so I don't forget.
28 A Oh, okay.

1 Q P 50, B and C.
2 A I mean I -- yeah. Thank you for
3 clarifying.
4 Q 50 B and C. Okay. So let's go to
5 the question again.
6 What was your design, for
7 effectiveness, the depth of the surface
8 casing of Porter 50 B and C?
9 A Okay. So I want to -- I want to
10 make a clear distinction here. When I apply
11 CP to a well casing, I conduct a -- a test
12 that gives me a target current that's needed
13 for that particular well casing by utilizing
14 E-log-I, and that tells me only one thing.
15 It tells me how much current is necessary to
16 protect that well. That's the only -- it
17 doesn't tell me that it's effective or not.
18 It just tells me, when I design a system,
19 that it needs "X" amount of current to apply
20 E-log-I to it, or cathodic protection to it.
21 The -- I cannot determine the effectiveness
22 of that. If you were to say, "Frank, at
23 10,000 feet or at 400 feet," I have no idea.
24 I mean I -- it's all speculation.
25 Q I hear you. I hear you.
26 A Yeah.
27 Q So that's based on what you know to
28 that date, design your best -- best

1 knowledge. Is that right?
2 A That's what I know now. I mean in
3 any -- without -- I -- well, let me just say
4 this: I could not say in any well, you know,
5 is the CP effective or not. There's so
6 many -- it's -- it's very -- it's a
7 complicated thing to say, "Yes" or "No," I
8 know that CP is effective. So I -- I can't
9 just say, "Yes, the CP was effective on
10 Porter 50 B and C." I can't say that.
11 Q I think -- I think you're doing a
12 good job of explaining the difference, and I
13 think I'm starting to really be clear that,
14 you know, validating effectiveness versus
15 putting together a design package --
16 A Yes.
17 Q -- are very distinct, and they need
18 to really be managed differently. Is that
19 correct?
20 A I'd like to think that I'm being
21 effective, but I know, in reality, I may or
22 may not be effective.
23 Q Okay. I hear you.
24 A And again, CP is only one -- one
25 way to address the integrity of the well
26 casing. There -- there -- I just know that
27 there are other things other than -- than
28 my -- my portion.

1 Q Appreciate that. So Mr. Selga,
2 when you say, "E-log-I," are you -- can you
3 explain how that -- is that physically done
4 on existing casing? Is that what you're
5 saying? When you get that number, you're
6 actually physically going out there, and
7 running a test and getting data readback on
8 a -- on a instrument. Is that -- is that my
9 understanding?
10 A Yes. It's a -- it's a -- it's a --
11 it's a tool used in the industry where I
12 would take a native potential -- I would take
13 a native potential on the well casing, and
14 it's done with a -- and I'm thinking -- I
15 don't know where you guys back -- where
16 everybody's background is in cathodic
17 protection. But, like in horizontal
18 pipelines, I can use a reference electrode,
19 make a connection to the pipe with a
20 multimeter, and I tell you the effectiveness
21 of the CP at that point on that pipeline.
22 Q Uh-huh.
23 A With a well casing, I cannot do
24 that. So that's why I want to
25 differentiate --
26 Q Uh-huh.
27 A -- when I come up with a design,
28 it's based on what I do in the design,

1 utilizing E-log-I to determine the amount of
2 current that's needed for that well to have
3 cathodic protection.
4 Q Okay. I appreciate that. So I
5 don't want to belabor this more, but I think
6 I'm becoming a little bit less dense than I
7 was a few minutes ago. So I do understand
8 that part.
9 I would like to ask this one
10 question: Is the reason why you're not able
11 to understand the effectiveness have to do
12 with time, meaning would it mean a number of
13 years, like ten years, let's say, to see if
14 it's doing its job? Is that what you mean?
15 Or you're just talking, for eternity, you'll
16 never really know?
17 A No. I mean -- I mean so if -- if
18 there's a hypothetical situation, I'm going
19 to give you a hypothetical answer, which
20 could be, you know, the value of that may or
21 may not be significant. So I mean the only
22 way -- there are many ways to know if your
23 cathodic protection is effective, or if your
24 whole corrosion program is effective.
25 There's many ways to determine that.
26 Q How will you do it on these two
27 wells, how will you determine the
28 effectiveness on these two wells?

A I didn't know. I -- I --

Q I mean I know you don't work there anymore. But, if you were still working there --

A Yeah.

Q -- let's say ten years down the road, what tools or what are you using to -- to say this is effective or not?

A I don't -- I personally don't have any tools that I can employ. That -- that well, and the integrity of that well, that belongs to another group.

Q Well, okay. I feel like I'm hearing two different things.

A Uh-huh.

Q Am I hearing that there is no way to know or no way for you personally, in your position, to know?

A I mean --

Q I want to make sure --

A Okay.

Q -- I understand. You see the difference?

A Yeah. I think so. So your question was for the effectiveness --

Q Is there no way to know effectiveness in the industry, or is it no way for you, Frank Selga, in the role you

1 are, as a specialist, to know?
2 MS. CLORFEINE: In regards to cathodic
3 protection?
4 MR. HOLTER: Yeah; the effectiveness of
5 it.
6 THE WITNESS: There are ways. Like
7 running a CPET would be advantageous. That
8 would give an indication as to the
9 effectiveness of cathodic protection.
10 MR. HOLTER: Q Okay. So, there is a
11 way to know the effectiveness of a cathodic
12 protection?
13 A But -- but, I also want to phrase
14 that carefully, is that even a CPET is not
15 the end-all save-all exhaustive means to
16 determine if your CP is effective. There's
17 so -- believe me, when I say -- I mean
18 because my specialty is horizontal pipes.
19 Q Sure. Yeah.
20 A And like I said, I can determine
21 the effectiveness in my corrosion. I can
22 even dig up a pipe, and I can visually
23 inspect, yes, I've got corrosion occurring or
24 I don't, or I can take above ground
25 measurements. With wells, it's a very
26 complex environment. And as a matter of
27 fact, there's very -- in terms of
28 regulations, we are -- I think everybody in

1 the room knows, 192 or 195, it addresses
2 specifically cathodic protection on the
3 pipeline. But, there is -- there's -- in
4 relative terms, there's nothing for
5 down-hole. Even NACE offers just some
6 guidance. There's no document or place with
7 specificity that says, "You must do this, and
8 in this order, to either --" especially in
9 evaluating the performances of cathodic
10 protection. So it's a big subject. I have a
11 little part in it, and I think that's -- I
12 think that's --]
13 Q I appreciate it. I have a couple
14 -- a few more questions.
15 So considering what you said and
16 that you've gone -- that Mansdorfer -- and
17 I'd like to be clear. Who was it that asked
18 you to do P 50-B and C again? Just to
19 clarify.
20 A I'm the one that asked. I saw the
21 new wells come in and I said, "Would you like
22 me to put CP on those two wells?"
23 Q Okay. Considering what you've told
24 us about, can you give us a really condensed
25 reasoning for you to approach them in light
26 of the fact that maybe verification and
27 validation of your work may not come to
28 fruition based on how big of a subject it is?

1 A I'm having a problem identifying
2 the question you have.
3 Q I'm seeing that you had a level of
4 fortitude and expert comfortableness to go to
5 them and say, "I think this needs it."
6 Yet, I'm also hearing you say that
7 validating all that work and money spent may
8 not -- you may not know if it's even
9 effective. So can you reconcile those two
10 things that I'm hearing?
11 A Let me frame it this way: I've
12 always made -- or not always, but I've made a
13 few attempts to offer to apply CP to the well
14 casings at Aliso.
15 Now, that's one question. So the
16 effectiveness of that cathodic protection,
17 that's another question altogether.
18 I don't -- I would hope has a CP
19 dude, that, yes, my CP is helping in the
20 corrosion control of that well casing.
21 MR. SHER: Off the record for one
22 second.
23 (Off the record.)
24 MR. SHER: Back on the record.
25 MR. HOLTER: Q Mr. Selga, are you
26 comfortable with the question as it stands?
27 A I forgot what it was. I'm sorry.
28 It is hard. I'm not used to this. So I do

1 get a little fatigued. So if you could ask
2 it again, I'd be glad to answer.
3 Q The question is this: May you
4 please reconcile the challenge of validating
5 the effectiveness of a CP package, which you
6 are promoting to be installed during these
7 years as your role as a CP expert at
8 SoCalGas?
9 A So could you rephrase that, Randy?
10 And it's not you. It's probably me.
11 Q I don't know if it's -- I'm not
12 trying to make us dig deep. It was just,
13 kind of, an understanding of -- I'll be you
14 for a minute and say, "I'd like to put a CP
15 package in."
16 And then maybe the comeback is,
17 "Well, how do we know if it's effective?"
18 And then you say?
19 What do you say if this were the
20 gas company storage field managers -- you
21 know, "Mr. Selga, how can we know that our
22 money is well spent and this is going to help
23 our asset stay intact ten years?" So to
24 speak.
25 A Fair question. I mean, the
26 assumption is always made that whenever you
27 apply CP -- and I'm talking in general terms
28 not in reference to specifically to any well

1 casings -- but when you apply CP, the
2 assumption is you're controlling or
3 mitigating corrosion.
4 But, again, talking back to, like,
5 Porter 50-B and C, I don't really know. I'd
6 like to think that my work that was done is
7 sufficiently protecting the well casings.
8 But I can't say with certainty I know that to
9 be true.
10 Q I appreciate that. So in time is
11 one of the methods to validate that this
12 E-LOG we're talking about, is that one way
13 that it could be used?
14 A It can be used. Because what it
15 suggests is when you conduct a survey, it
16 suggests -- and it kind of describes I'm
17 plotting out the potential reads. And then
18 -- over time. And then I'm incrementally
19 increasing current at each step. And then
20 it's going to start to make a turn. So to
21 have this L kind of shape.
22 So the only thing that that tells
23 me is where polarization is occurring on a
24 structure. Does that mean that polarization
25 is occurring on every little -- every foot,
26 every section of pipe? No.
27 But what it's saying is that when I
28 have my reference electrode out here and I'm

1 taking measurements, it's just saying it's
2 looking at the entire column to zero feet to
3 however many feet. The only thing it's
4 saying is polarization has begun. So that
5 gives me a target rate. Something to target
6 for the amount of cathodic protection that
7 well needs.
8 Q Okay. Appreciate that. And you
9 spoke about this earlier with the anode
10 location for the tool. Okay.
11 All right. One final one, and I
12 appreciate it. When specifically you
13 referenced -- going back to this topic when
14 Mr. Mansdorfer stated one well -- I don't
15 remember which one it was -- did not need it
16 because there was no oxygen. That was the
17 prior conversation.
18 That analysis of whether or not a
19 native soil is going to need -- I mean, that
20 structure, the down-hole casing will need
21 cathodic protection, is it based on a native
22 soil reading? Or test? Or analysis?
23 A I don't know the criteria -- all
24 the criteria like a Jim Mansdorfer or an
25 underground storage engineer. I don't know
26 all the criteria that they use.
27 You know, the only thing I can
28 speak to is in what I know generally. And so

1 in respect to the -- I forgot the question
2 again.
3 Q We're talking about soil
4 conductivity and the PH. A number of things
5 that would affect the decision to put in CP?
6 A There's a number of things. Like
7 the type of mud that was used in the
8 construction of the well. If it was
9 conductive. Certain -- I believe it's
10 starch-based muds that are more susceptible
11 to MIC. The change in metallurgy, if there
12 is such a thing; when they use the tongs;
13 when they drill the pipe into the ground.
14 That's a more active or tend to be anodic.
15 There could be differences in aeration, there
16 could be differences in conductivity in the
17 soil. There's a number of things. The age
18 of the well itself, the amount of cement and
19 the quality of the cement that was done on
20 that well. These are all things that should
21 be considered.
22 Q That's very helpful. I appreciate
23 it. Are you saying those parameters and
24 knowns are what another team used before you
25 came in with your package to assess it?
26 A I can't -- I don't know
27 definitively that those -- I would think that
28 those were some of the elements that they

1 looked at.
2 Q I understand.
3 A I can't say that's what they did.
4 Q But that was never you in this case
5 of your tenure 2009 to 2017. You never did
6 that; is that right?
7 A No.
8 Q Okay.
9 MR. HOLTER: That's it. I appreciate
10 it.
11 THE WITNESS: Sure.
12 MR. HOLTER: Thank you so much.
13 EXAMINATION
14 BY MR. BRUNO:
15 Q Mr. Mansdorfer, for -- excuse me.
16 Mr. Selga?
17 A Different pay, man. I'll take it.
18 Q I was testing you.
19 So, Mr. Selga, so we're closing in
20 on the last half hour. So I'm going to be
21 quick. I got about four questions.
22 Theoretically, if you designed
23 E-LOG I, is it affective?
24 A It may or may not be.
25 Q Theoretically, your understanding
26 of E-LOG I, if you design your system to
27 using that standard, it doesn't help you with
28 theoretical effectiveness as opposed to

1 actual effectiveness?
2 A You know -- we're talking
3 theoretical; right?
4 Q Yes, sir.
5 A So what E-LOG I suggests -- and
6 again, I'll go back to that. When you
7 conduct a E-LOG survey, it tells me when the
8 structure that I'm looking is being
9 polarized.
10 But keep in mind, this is not like
11 taking a measurement on a pipe. I can do it
12 every few feet, and I can tell you the
13 effectiveness of the CP. When I have a
14 reference electrode located out here
15 somewhere, it's liking at the entire well
16 casing from surface to bottom.
17 Q Sure.
18 A So it's not -- to compare the two,
19 it's quite a stretch.
20 Q But that's the best you have;
21 right? E-LOG I? That's what SoCalGas is
22 using?
23 A Well, that's what I employed.
24 Q That's what you believe in? That's
25 what you asked for?
26 A Well -- what I asked for?
27 Q That's what you offered to install
28 when using that criteria to your employer?

1 A I wouldn't say it's a criteria. I
2 would say that was -- it's a tool that helps
3 me to design for the amount of DC current
4 that's it's going to need. Does it need five
5 amps? One amp? Then I'll design the CP
6 system to do that.
7 Q How many amps on 50-B and C?
8 A I just -- you can find it in
9 Maximo, but I believe it was somewhere
10 between four and six amps a piece.
11 Q How does that compare in the
12 pipeline industry on your experience on
13 transmission lines for a distribution line?
14 A It's -- I mean -- this is a
15 entirely different situation. Because,
16 again, you can have -- typically, when you
17 put a pipeline in the ground, it must have
18 what? A protective coating that's conducive
19 to cathodic protection, and it's something I
20 can easily or anybody qualified can easily
21 determine the effectiveness of the CP. On
22 well casing, I don't think anybody can say
23 that.
24 Q That wasn't my question. What I'm
25 asking you is how does four to six amps
26 compare to your experience on a rectifier on
27 a distribution system?
28 A What I would consider is -- when we

1 consider designing CP for a -- like a
2 horizontal pipe, I'm considering the coating
3 quality. That's a huge thing. The surface
4 area of the pipe and then a percentage of the
5 coating holiday that's in that pipe.
6 So with pipelines now, they're
7 extremely well coated. I've coated -- I've
8 applied CP on a pipeline that was six inches
9 in diameter, about a mile long, and it took a
10 half a milliamp to protect it. It didn't
11 even register on my multimeter. That's how
12 good the quality of wrap is on that. You
13 only have this much that you're protecting
14 because if you're to add up all the holidays.
15 On a well casing, that's bare. You assume it
16 to be bare and whatever the diameter. And
17 then you can calculate the surface area based
18 on its length and its diameter. And you
19 assume that it has no or little coating.
20 So to compare the two, it's a
21 pretty -- it's hard to compare them.
22 Q Would you say four to six amps is
23 generally higher than you would find on a
24 rectifier system on a distribution system?
25 A I've used rectifiers to protect
26 thousands of feet of pipe. And I've used a
27 lot more than that to protect it.
28 Q Okay. Thank you, sir.

1 A Yeah.
2 Q So in your experience at SoCalGas,
3 did anyone ever ask you to put CP on a well?
4 A I can't say explicitly. I can say
5 that there was a conversation at Honor Rancho
6 when a new well was put in, and we talked
7 about.
8 I think the general consensus at
9 that time is just it's going to happen anyway
10 at Honor Rancho. So I did talk to the field
11 manager about that. I don't remember who
12 initiated the conversation.
13 Q So other than the one instance you
14 just described at Honor Rancho or somebody
15 told you it was going to happen go ahead and
16 do it, I guess. Did anyone ever approach you
17 and say, "Mr. Selga, put a CP system on these
18 wells at this field"?
19 Or was it always you offering,
20 "Hey, do you want some CP?"
21 A Okay. It was always implied that
22 if CP was at Goleta or Honor Rancho, that I'm
23 going to provide cathodic protection to those
24 wells. That was implied. So I didn't have
25 to ask nor did anybody have to ask me.
26 Q All right.
27 A So if I became aware of a well that
28 was going in at Honor Rancho, we'd talk about

1 it. And, you know, I don't remember the
2 specifics. But at Aliso, no one has ever
3 asked me to put a well under cathodic
4 protection.
5 Q And the reason I ask is because you
6 refer to the underground storage group a lot
7 and their expertise. I recognize that you
8 respect the credentials and education of some
9 of them. But they never approached you about
10 putting CP on. It was only when you offered
11 that they said, "Yes," to those two wells.
12 50 B and C?
13 A Yeah. I made that offer.
14 Q Okay. All right. Final question.
15 Going back to Mr. Mansdorfer and the O2
16 discussion. Earlier I asked you if that made
17 sense to you. I'm paraphrasing. You said
18 something like not entirely or a little bit.
19 I want to ask you a little more
20 about that. Did you take that to mean CP
21 will not work because of lack of O2? Or
22 corrosion threat is not applicable because of
23 lack of O2?
24 A I'm not sure if I understand your
25 question. Was it: Did I think it was a
26 threat?
27 Q Let me rephrase it. So, again, I'm
28 referring to the comment on O2 that you

1 referred to as when you asked Mr. Mansdorfer
2 about some CP and he said, "No. Because
3 there was no O2 in that well." What does
4 that mean to you?
5 A Well, what I understand it to
6 mean -- but, again, I mean, whenever someone
7 says there's no O2, they're suggesting that
8 that is not -- that is a driver that they're
9 considering in them making a decision.
10 But, again, I don't know all the
11 things that was -- all the things that were
12 in his mind and brain and his thought
13 process.
14 So, you know, so anything -- I may
15 have my own opinions on O2 in respect to
16 corrosion. I mean, so --
17 Q Thank you. Do you care about O2
18 when you're installing a CP system? Do you
19 need O2 to have an effective CP system?
20 A Well, I don't have -- O2 is
21 generally known as a depolarizer. So I'm
22 talking in general terms. I don't have
23 enough experience down-hole to say, "Yes.
24 There's O2 at 983 feet." I have no idea that
25 that exists.
26 So O2 -- I'm just talking in
27 general terms of cathodic protection. O2,
28 the presence of O2, it's a depolarizer. When

1 we apply CP onto a structure, it is -- we're
2 polarizing it. We're making it more electro
3 negative, and there's an electric chemical
4 process that occurs at the interface of that
5 pipe and where it interfaces with the soil.
6 If there's O2, O2 is a depolarizer.
7 It takes away that CP. Generally. I'm
8 talking general. I'm not talking --
9 Q Yes, Mr. Selga. If I understand
10 you correctly, to you what that meant was if
11 there's no O2, CP should work better?
12 A No. I don't see a -- I mean, I
13 don't see it that way. If there's a presence
14 of O2 doesn't mean that CP may or not be
15 effective.
16 Q You just said that O2 is a
17 depolarizer?
18 A Yes.
19 Q If there is no depolarizer,
20 theoretically a CP would be more effective?
21 A There are a number of depolarizers
22 out there but O2 being one of them.
23 Hopefully, you know, I would hope that my
24 cathodic protection is mitigating some of
25 that O2.
26 It doesn't mean that it's going to
27 totally wipe out the CP, what it means is
28 that's another thing that a cathodic

1 protection person is combatting. That's all
2 it is.
3 Q Do you think you need O2 to corrode
4 a pipe?
5 A No. Or let me put it this way:
6 How does one know -- well. No. I don't
7 think -- certainly, O2 would -- certainly,
8 that is a depolarizer and it could accelerate
9 corrosion. Certainly.
10 Q But I'm asking about the lack of --
11 I understand you to say that Mr. Mansdorfer's
12 reason he gave you was there's no O2. So if
13 there's no O2, your understanding is there
14 could still be corrosion?
15 A Yeah. My understanding is you
16 could still have corrosion occurring even in
17 the absence of O2.
18 Q Okay. That's all I'm asking.
19 A But how do you quantify that? How
20 does someone quantify that? That's why I'm
21 hesitating on that.
22 Q I was just trying to make sense of
23 that conversation you had with Mr. Mansdorfer
24 whether he felt that your CP wouldn't work,
25 or if the threat of corrosion itself would
26 not be present?
27 A I can't speak to what Jim was
28 thinking.

1 Q I understand. That's why I was
2 asking what it meant to you. That's all I
3 had.
4 A I had to labor through that.
5 MR. BRUNO: That's all I had. I'm
6 going to turn it over to Mr. Gruen.
7 EXAMINATION
8 BY MR. GRUEN:
9 Q Mr. Selga, just regarding Mr.
10 Bruno's question about O2 and the
11 relationship to corrosion. I understood you
12 to say there may be other reasons, other
13 contributing factors to corrosion even
14 without O2. Did I understand that right?
15 A Yes. Or other mechanisms. When
16 corrosion occurs, it's usually a combination
17 of various mechanisms. It can be a
18 concentration cell. It could be a -- could
19 be differences in availability of O2. It
20 could be different soil types. Highly
21 resistive next to a low-resistive soil.
22 There are so many mechanisms. There's MIC to
23 consider.
24 Q Would it follow that there are
25 reasons why cathodic protection is a good
26 idea even with the absence of O2?
27 A Me as a CP practitioner, I want to
28 put CP on the world. I'll put it on plastic;

1 right? I am sorry.
2 Q That's okay.
3 A But that's my sentiment. I'm a
4 cathodic protector. I like putting CP on
5 things. So whether it's effective or not,
6 but that's another thing. I may try to put
7 CP on plastic, but it's not going to work.
8 Q Would CP work to protect against
9 corrosion even if there was no O2?
10 A It's kind of hypothetical when you
11 say there's no O2, and I'm having a hard
12 time. When someone says that there's no O2,
13 how do you get that? I don't even know if
14 that can exist. I'm not a technical expert
15 in that sense. I just don't know. But I
16 have a hard time -- when someone says there's
17 no O2, are they talking in relative terms?
18 I mean, I heard even somewhere one
19 of my NACE fellow instructors found O2 in
20 their space vehicle. I forgot what it was.
21 The space station or whatever.
22 Q Let me ask you this: You mentioned
23 earlier Mr. Mansdorfer responded when you
24 said -- when you offered to put cathodic
25 protection on wells. His answer was there
26 was no O2. Did I understand that right?
27 A Yes, that's correct.
28 Q How did you understand him to mean

there's no O2 when he gave you that response?

A I don't -- again, I don't know his rationale entirely. I was given one piece of that.

Q Okay.

A Okay. So I can only make a judgment on what he gave me.

Q That's completely fair. I appreciate that. How -- are you familiar with the Southern California Gas Company Storage Integrity Management Program?

A I'm aware they have one, yes.

Q Did you have a role in feeding information to the Storage Integrity Management Program?

A Yes.

Q What is your understanding, briefly at a high level, of the Storage Integrity Management Program?

A Well, as far as the program itself, it's -- I mean, just my high understanding, it's an effort to ongoing enhancing our integrity to our storage facilities.

Q What information did you feed into the Storage Integrity Management Program?

A Am I -- like SIMP or some of the efforts that were going on at that time?

(Cross talk.)

1 THE REPORTER: I didn't hear that.
2 THE WITNESS: There's several parallels
3 or efforts going on. Like, I was doing
4 internal enhancement, SIMP. So I don't know
5 if you're talking about -- I mean, my
6 understanding that there is a SIMP Program as
7 it were. So I had input for budgeting on
8 that. I gave some input.
9 Q Okay. What other things did you
10 give input for?
11 A Principally, it was that. How much
12 money do you need? And justify it.
13 Q Okay. And what was the
14 justification that you gave?
15 A Well, in -- and there was another
16 effort going on. So -- and I'm not really
17 clear as -- because there are -- I had
18 multiple -- every year, you know, thereabouts
19 someone asked, "Hey, Frank, what do you want
20 for this year?"
21 And then for SIMP, there was
22 another -- more questions. And then for
23 another effort they were putting forth, there
24 were more questions. So I don't know. I get
25 them -- often get them confused.
26 Q Did you give your justification for
27 the budget inputs in writing?
28 MR. DRAGNA: This is SIMP budget?

1 MR. GRUEN: Correct.
2 THE WITNESS: I -- because I suggested
3 they -- that they put money available. And I
4 -- again, I don't remember if it was SIMP
5 specific. But I remember suggesting, "You
6 may want to put more in for two things. For
7 increased monitoring and mitigation and
8 internal corrosion and for well casings."
9 Q And what about well casings?
10 A Just to -- just -- they should -- I
11 have my normal number of -- so every year as
12 wells get depleted, I'll often make a
13 recommendation, "Hey, we need to replace this
14 well."
15 So as far as the existing wells --
16 I'm talking about cathodic protection wells
17 -- I would make a recommendation, "I'll
18 probably need one or two or however many for
19 the next coming year."
20 For SIMP, I think, I'm just
21 predicting where subsequent to what happened
22 at Aliso, the event. I suggested you may
23 want to throw some more money -- assign some
24 more money for that.
25 Q Do you have any of these
26 justifications before the incident at Aliso?
27 Were you asked to give inputs into SIMP prior
28 to October 23rd, 2015?

A I don't recall where we were in that. Because everything -- really, the past three years over there were real crazy. It was pretty busy. I just don't remember what the timeframe was.

Q What the time was?

A Yes, sir.

Q Okay. I didn't catch -- do you recall giving any written justifications for the budget inputs into SIMP?

A I remember -- I remember -- I don't remember with great clarity on that. I remember -- you know, I remember talking to Phil and my director at the time.

Q Phil?

A Phil Baker.

Q Baker, yeah. In terms of -- you mentioned internal corrosion as one of the justifications. Why internal and not external? I'm gleaning from that just internal. So why the thinking to have internal corrosion being a justification but not external?

A Well, I gave inputs for both.

Q Oh, for both. Okay. I see.

A Yes, sir.

Q I think I just misheard you.

A I am sorry.

1 Q Not at all. Okay. Do you recall
2 talking with Amy Kitson? She was one of your
3 reports during your tenure from 2009 to 2017;
4 correct?
5 A I reported to her, yes.
6 Q Did you talk to her about SIMP when
7 you reported to her?
8 A I don't remember talking about
9 SIMP. And you got to remember there's
10 multiple things I'm trying to manage at that
11 time, and SIMP was just another issue that
12 was out there.
13 I get so many people, they'll ask
14 me, "What do you need?" Or I'll tell them,
15 "This is what I need." And so on and so on.
16 It's an ongoing type of situation.
17 Q Okay. Let me switch gears and just
18 -- well, let me ask you, could you briefly
19 talk about how corrosion factored into SIMP
20 when you gave the inputs on corrosion?]
21 A I can only speak to two issues.
22 Q Okay.
23 A Cathodic protection, and they maybe
24 asked me for some other things. But I shared
25 with what we need in terms of cathodic
26 protection, and for our internal corrosion
27 enhancement program that we were trying to
28 keep going.

1 Q Okay. When you talk about the
2 inputs, are you talking about inputs to sit
3 for down-well? Or input for surface-related
4 things?
5 A Principally, everybody had an
6 understanding that our efforts for internal
7 were the surface facilities.
8 Q Surface?
9 A Because that's where I felt we
10 really needed to dial in on.
11 Q Okay.
12 A For the external, I -- I'm trying
13 rack my brain. Because, like I said, there
14 were multiple -- I'm being asked to predict,
15 like, what's the budget going to look like
16 next year in terms of, like, installing new
17 facilities, like, replacement cathodic
18 protection on wells. And I don't remember
19 the specificity. I may have brought up that
20 we probably should load some in for well
21 casings as well.
22 Q Okay. Let me ask you about the
23 cathodic protection profile tools that you
24 mentioned. And I believe you talked about
25 those in the context of Goleta.
26 Did I understand that right?
27 A My experience -- and, again, this
28 is technology in the 70s. So my

1 understanding is limited to just what I read
2 about these particular studies that were
3 conducted in a few fields.
4 Q Which fields?
5 A Montebello, Playa Del Rey, Honor
6 Rancho, Goleta.
7 Q Okay. And did you look at the
8 findings of the cathodic protection profile
9 tools?
10 A Yes. The old -- the old report
11 that's were generated, yes. Yes, I did.
12 Q Was cathodic protection put on each
13 well where there was a cathodic protection
14 profile tool employed?
15 A No.
16 Q Did the cathodic protection profile
17 tools recommend to put cathodic protection on
18 the wells where they looked?
19 A I don't know the results of those
20 surveys. So I don't know what they
21 determined at the -- I can only guess at what
22 they were suggesting. So I don't know. I
23 would be -- I would be guessing.
24 Q Okay. Why do you know why Southern
25 California Gas Company stopped using the
26 cathodic protection profile tools?
27 A I have no idea. That was prior to
28 -- I was in high school probably around all

1 the time of that stuff.
2 Q Okay. You don't come across
3 anything that suggested why the findings, why
4 the tools were stopped when you were
5 reviewing the findings?
6 A I don't have any idea.
7 Q Okay. Let me ask you, given the
8 expertise that you've talked about that you
9 told us about, and we appreciate the insight
10 that you've shared, do you believe that
11 SoCalGas has done enough with regards to
12 discovering corrosion at Aliso Canyon?
13 A Sir, I mean, that's your -- you're
14 asking me to comment on something that I
15 don't have a full knowledge of. I mean, I
16 just don't -- I can't speak to -- generally
17 speaking, I've been with the gas company
18 37 years and now it’s continuing. And I know
19 that this company, I'm proud of the fact that
20 they try to constantly improve, generally
21 speaking. Including myself, you know, in my
22 efforts, I'm trying to continually improve.
23 But I can't speculate on your question there.
24 Because I'm too afraid to speculate on
25 something that I don't have full knowledge
26 of.
27 Q Does anyone have full knowledge to
28 answer that question?

1 A Can you restate that question so I
2 can --
3 Q Sure. Let me restate.
4 Do you know of anyone at SoCalGas
5 who would have full knowledge to opine as to
6 whether the company has done enough with
7 regards to discovering corrosion at Aliso?
8 A On the well casings?
9 Q Correct?
10 A I don't know of any particular
11 person.
12 Q Given the knowledge that you do
13 have, and you have more knowledge than most
14 if you would accept that, with the knowledge
15 that you have, do you believe that SoCalGas
16 has done enough with regards to discovering
17 corrosion at Aliso?
18 MR. DRAGNA: He's already answered
19 that.
20 THE WITNESS: Yeah. I'm not
21 comfortable --
22 MR. GRUEN: Q What --
23 A I'm not comfortable speculating on
24 something that I don't know with certainty.
25 Q Understood. Given the knowledge
26 that you have, what improvements would you
27 suggest, if anything?
28 MR. DRAGNA: To?

1 MR. GRUEN: Q With regards to
2 addressing corrosion at Aliso?
3 A Well, I think it's always good,
4 whenever anything occurs -- whenever -- like,
5 if we find corrosion on a pipeline, I feel
6 good in general terms that we're doing
7 everything that we can to get to the
8 underlying issue. So I can only speak in
9 general terms. I have a good feel that this
10 company is trying to do the right thing. And
11 I feel confident in that.
12 Could things be missed? It's
13 possible. Yeah. I'm not going to claim that
14 we're perfect. So...
15 Q Okay. Can you speak specifically
16 as to whether anything was, in fact, missed
17 with regards to addressing corrosion on the
18 wells at Aliso?
19 A I can't --
20 Q Prior to October 23rd, 2015?
21 A I don't have a high-level
22 confidence to say -- to comment. I just --
23 Q Okay.
24 A It's not within my authority or,
25 maybe, expertise.
26 Q Okay. Let me just talk about your
27 conversations, quickly. Offering to put
28 cathodic protection on the wells, the three

1 times that you offered, you remember talking
2 about that to us and you made offers to
3 Mr. Mansdorfer, I believe.
4 When you offered, did
5 Mr. Mansdorfer ask you to explain why you
6 thought it was a good idea to put cathodic
7 protection on the wells?
8 A No, Jim never asked me.
9 Q Okay?
10 A To my knowledge, I don't remember
11 any of that in our conversation. Doesn't
12 mean it wasn't there, it's just I don't
13 remember it.
14 Q Okay. Anyone else who would have
15 had a decision-making capacity there who you
16 offered to who would have asked for your
17 input as to why you were offering?
18 A No. I can't recall any situation
19 where that happened.
20 Q Okay.
21 MR. GRUEN: Let's go off the record.
22 (Off the record.)
23 MR. GRUEN: Back on the record.
24 Mr. Selga, thank you very much for
25 your time. We recognize you've been
26 subpoenaed to be here, but we appreciate the
27 light that you shed and your willingness to
28 answer questions.

1 THE WITNESS: Yes, sir.
2 MR. GRUEN: Thank you for your time.
3 Thank you.
4 Off the record.]
5 (Whereupon at the hour of 4:02 p.m.,
6 the examination under oath was
7 concluded.)
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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, KARLY POWERS, Certified Shorthand Reporter No. 13991, in and for the State of California do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on August 8, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 8th day of August, 2018.

KARLY POWERS
CSR No.#13991

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Rebekah L. De Rosa, Certified Shorthand Reporter No. 8708, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on August 8, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 8th day of August, 2018.

Rebekah L. De Rosa

Rebekah L. De Rosa
CSR No. 8708

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, JASON STACEY, Certified Shorthand Reporter No. 14092, in and for the State of California do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on August 8, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 8th day of August, 2018.

Jason A. Stacey
CSR No. 14092

SED Supplemental Data Response to SoCalGas Data Request 3
Supplemental information is shown in red as of 1/6/2020.
Supplemental information is shown in red as of 1/15/2020.

General disclaimer: SED reserves the right to update Its data response, and has identified where SED requires more time in each answer. SED reserves the right to add to its answer to all question subparts requesting SED to identify the laws, rules, regulations and/or industry standards. Where SED has quoted from its testimony to answer a question, SED has omitted the footnotes from SED's testimony in the answer. However, these footnotes are all incorporated into each answer by reference.

1. YOU assert that SoCalGas failed to investigate the "blowout" from well Frew-3 (Violation 1 alleged in OPENING TESTIMONY).

a. Please describe the investigation that SED believes would have constituted an adequate response to the "blowout" from well Frew-3 on December 31, 1984.

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating this blowout. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the blowout that is or was in the control of SoCalGas, and analyze it to determine what type of investigation might have been adequate.

Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require the investigation described in its response.

Despite, SED's objection to question 1a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. Please see the passage on SED Opening Testimony, pages 8 and 9, which states, "SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451 as follows:

- One violation for failure to investigate the blowout from well Frew-3 spanning from December 31, 1984, the last possible date of the blowout, to October 23, 2015, the date of the incident.

c. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to investigate the blowout from well Frew-3.

SED relies on the Blade Report for this violation. SED may update this answer at a later time.

d. Identify the basis on which YOU contend that this alleged failure is a violation of California Public Utilities Code Section 451 ("Section 451").

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 1b.

2. YOU assert that SoCalGas failed to investigate the "blowout" from well FF-34A (Violation 2 alleged in OPENING TESTIMONY).

a. Please describe the investigation that SED believes would have constituted an adequate response to the "blowout" from well FF-34A on December 31, 1990.

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating this blowout. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the blowout that is or was in the control of SoCalGas, and analyze it to determine what type of investigation might have been adequate.

Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require the investigation described in its response.

Despite, SED's objection to question 2a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. Please see the passage on SED Opening Testimony, pages 8 and 9, which states, "SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451 as follows:

- One violation for failure to investigate the blowout from well FF-34A, spanning from December 31, 1990, the last possible date of the blowout, to October 23, 2015, the date of the incident.

c. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to investigate the blowout from well FF-34A.

SED relies on the Blade Report for this violation. SED reserves the right to update this answer at a later time.
d. Identify the basis on which YOU contend that this alleged failure is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 2b.

3. YOU assert that SoCalGas failed to investigate the three parted casings discovered on December 31, 1994 (Violation 4 alleged in OPENING TESTIMONY).

a. Please describe the investigation that SED believes would have constituted an adequate response to the three parted casings discovered on December 31, 1994.

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating the parted casings. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the question that is or was in the control of SoCalGas, and analyze it to determine what type of investigation might have been adequate.

Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require the investigation described in its response.

Despite, SED's objection to question 3a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. Please see the passage on SED Opening Testimony, pages 8 and 9, which states, "SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451 as follows:

- Four violations: One for failure to investigate each of the parted casings discovered between 1969 and 1994. As one of the parted casings must have been discovered in 1969 to set the beginning of the range, that first violation spans from December 31, 1969 the last possible date of its parting, to October 23, 2015, the date of the incident. Assuming that the remaining three parted casings were discovered December 31, 1994, those three separate violations each span from, at the latest, December 31, 1994 to October 23, 2015.

c. Did SED ever conduct an audit of SoCalGas relating to whether SoCalGas investigated the three parted casings discovered on December 31, 1994.

SED objects to this question as unduly burdensome on the grounds that it asks a question that SoCalGas does or should have the answer to. SoCalGas is or should be aware of audits that SED has conducted on SoCalGas. SED notes as part of its objection that SoCalGas should avoid asking questions to which SoCalGas does or should already have the answer in that they waste the limited time and staff resources of SED in this investigation. Failure to heed this instruction may result in SED identifying additional examples in which SoCalGas is not cooperating with SED's investigation.

d. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to investigate the three parted casings discovered on December 31, 1994.

SED relies on the Blade Report for this violation. SED may update this answer at a later time.

e. Identify the basis on which YOU contend that this alleged failure is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 3b.

4. YOU assert that SoCalGas failed to investigate the first parted casing in 1969 (Violation 3 alleged in OPENING TESTIMONY).

a. Please describe the investigation that SED believes would have constituted an adequate response to the first parted casing in 1969.

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating this parted casing. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the question that is or was in the control of SoCalGas, and analyze it to determine what type of investigation might have been adequate.

Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

SED requires a complete answer to Data Request 52, Question 2 as a condition precedent to completing the answer to this question. For reference, that question asks:

Related to AC_CPUC_SED_DR_27_0000351 July 20, 1962, Tidewater prepared an evaluation of the SS reservoir for future Sesnon Gas Storage distributed for review before August PUC hearings. Please provide all correspondence, reports, studies and testimonies, and the final contract for acquisition of the Sesnon Gas Storage field that occurred between 1962 and 1973 between Tidewater (and its associates),

Pacific Lighting, and the PUC regarding assessment and acquisition of the Sesnon Gas Storage (Aliso Canyon).

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require the investigation described in its response.

Despite, SED's objection to question 4a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. Please see the passage on SED Opening Testimony, pages 8 and 9, which states, "SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451 as follows:

- Four violations: One for failure to investigate each of the parted casings discovered between 1969 and 1994. As one of the parted casings must have been discovered in 1969 to set the beginning of the range, that first violation spans from December 31, 1969 the last possible date of its parting, to October 23, 2015, the date of the incident.

c. Did SED ever conduct an audit of SoCalGas relating to whether SoCalGas investigated the first parted casing in 1969.

SED objects to this question on the grounds that It Is unduly burdensome. As the entity that was audited, SoCalGas has or should have the answer to this question. SED reminds SoCalGas, pursuant to the meet and confer in November, that questions such as this one, where SoCalGas already has the answer, wastes limited SED staff time and resources, and should not be asked. The instant question should be withdrawn.

d. Identify the basis for SED's assumption that the first parted casing was discovered, at the latest, on December 31, 1969.

As noted on pages 8 and 9 of SED's opening testimony,

SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451, as follows:

> Between 1969 and 1994, four wells were discovered to have parted casings. However, Blade found no evidence that SCG prepared root cause analyses, collected samples, performed lab analyses, or taken photos of failures, or developed failure analysis reports to document these failures. The only documents found were well operations daily reports where on-site rig activities were reported.

Each of these sentences reference to, and are based upon page 165 of the Blade Report. As that part of the report notes that four wells were discovered to have parted casings between 1969 and 1994, SED assumes that at one well had a parted casing that was discovered the last possible date of 1969, because that would be the basis for the start date of 1969. SED conservatively assumes the last day of 1969 as the start date of that violation, the last possible day that first well discovery could have happened.

SED reserves the right to update the date of this violation from conservative assumptions to more concrete dates if SED discovers additional information.

e. Identify the date on which YOU understand SoCalGas took control as operator of the ALISO CANYON.

SED objects to this question on the grounds that it is unduly burdensome in that SoCalGas Is asking a question to which SoCalGas demonstrably does or should already have the answer. SED reminds SoCalGas to avoid wasting SED limited staff time and resources asking such questions.

f. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to investigate the first parted casing.

SED relies on the Blade Report for this violation. SED may update this answer at a later time.

g. Admit that SoCalGas could not have violated any requirement or order of the Commission with respect to the maintenance and operation of Aliso Canyon prior to assuming control as operator of ALISO CANYON.

SED concedes this point, provided that SoCalGas had no role in ownership, maintenance, operation, or any control whatsoever. SED reserves the right to amend its testimony accordingly.

h. Identify the basis on which YOU contend that this alleged failure is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 4b.

5. YOU assert that SoCalGas failed to investigate the remaining 54 leaks (Violations 7-60 alleged in OPENING TESTIMONY).

a. Please describe the "investigation" SED believes would have constituted a reasonable response to each of the "remaining 54 leaks."

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating the leaks. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the question that is or was in the control of SoCalGas, and analyze it to determine what type of investigation might have been adequate.

Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right provide an additional substantive answer.

Generally, the 2014 investigation of FREW 2 demonstrates the type of investigation that would be reasonable to determine the extent and cause of earlier leaks detected by SoCalGas. While 2014 tools may be more refined, the basic tools have been available for decades.

SED requires an answer to Data Request 52 Question 9 as a condition precedent to providing a complete answer to this question. For reference, that question asks:

> In addition to the SIMP Model Studies performed in 2014 on FREW 2, identify all other similar studies performed on other Aliso wells prior to October 23, 2015. For each study identified, provide a complete copy of the resulting report(s) that present log interpretations and results. Each report should be provided in separate, searchable pdf document(s).

Despite, SED's objection to question 5a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. As noted on pages 8 and 9 of SED's opening testimony,

SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451, as follows:

- To avoid double counting violations, SED assumes that the 60 leaks identified before the Aliso Canyon incident included the six blowouts and parted casings identified above. As such, the remaining 54 leaks that went without investigation should constitute a separate set of up to 54 violations. At the latest, these violations began on October 22, 2015, the last possible date before the incident on October 23, 2015.

c. Did SED ever conduct an audit of SoCalGas relating to whether SoCalGas investigated the remaining 54 leaks.

SED objects to this question on the grounds that It Is unduly burdensome. As the entity that was audited, SoCalGas has or should have the answer to this question. SED reminds SoCalGas, pursuant to the meet and confer in November, that questions such as this one, where SoCalGas already has the answer, wastes limited SED staff time and resources, and should not be asked. The instant question should be withdrawn.

d. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to investigate the "remaining 54 leaks."

SED relies on the Blade Report for this violation. SED may update this answer at a later time.

Blade reviewed the well files and did not find any records that suggested an investigation to determine the cause of leaks was performed for the 54 leaks. Based on recent review of well file FREW 2 compared to the SIMP Study for well file 2, it appears that SoCalGas may only add logs to the Well File, not reports or findings. Therefore, SED requires an answer to Data Request 52 Question 9 as a condition precedent to providing a complete answer to this question. For reference, that question asks:

> In addition to the SIMP Model Studies performed in 2014 on FREW 2, identify all other similar studies performed on other Aliso wells prior to October 23, 2015. For each study identified, provide a complete copy of the resulting report(s) that present log interpretations, analyses, test results, and results. Each report should be provided in separate, searchable pdf document(s).

e. Identify the basis on which YOU contend that this alleged failure is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 5b.

6. YOU assert that SoCalGas "did not properly follow its own 1988 plan to determine the condition of the casing in 12 wells" and SS-25. (OPENING TESTIMONY, page 10).

a. Please identify the law(s), regulations, or rules that required SoCalGas to test the production casing of its wells for metal loss on or about 1988.

SED objects to this question as mischaracterizing SED's testimony. SED's testimony asserts on page 10 that, "SoCalGas's failure to follow Its own 1988 plan to check the casing in 12 wells for metal loss violates Section 451." This violation does not discuss testing.

b. Please state the industry standard(s) for testing the production casing of oil and gas storage wells that were in effect on or about 1988.

SED objects to this question as mischaracterizing SED's testimony. SED's testimony asserts on page 10 that, "SoCalGas's failure to follow Its own 1988 plan to check the casing In 12 wells for metal loss violates Section 451." This violation does not discuss testing.

c. Please identify all tools available, on or about 1988, which were designed to evaluate the metal loss in the production casing of oil and gas wells.

SED objects to this question as unduly burdensome. SoCalGas has access to the same information as SED, and can research the tools available at this time period as well as SED can, and this places an undue burden on SED to identify each tool available at the time. Notwithstanding this objection, SED identifies the following tools.

Tools available on or about 1988 that were designed to evaluate the metal loss in the production casing of oil and gas wells include the following:

Corrosion Logs were used to detect pitting and wall loss in casings as early as 1971. (*See* Donald L. Katz, AIME, U. of Michigan, "Monitoring Gas Storage Reservoirs," June 10, 1971, SPE PAPER No. 3287. *See also,* J.A. Bazzari, Getty Oil Co./Kuwait Oil Co., "Well Casing Leaks History and Corrosion Monitoring Study, Wafra Field," 1981, SPE PAPER No. 17930 (see log showing detection of wall thickness, Figure 4, page 53.)

Other tools designed to evaluate metal loss are included in the following passage:

"Corroded casing sometimes can be located by a high-resolution caliper log; spontaneous-potential logs have been used to locate depth intervals where active corrosion is taking place (Kendall, 1965). Commercial logging services are available for detecting corroded casing. An electromagnetic casing inspection log measures changes in the mass of metal between two coils; loss of mass may be due to corrosion (Edwards and Stroud, 1964). A pipe-analysis survey is run with a centralized probe that employs several coils (Bradshaw, 1976). This survey is reported to provide information on the thickness of casing penetrated by corrosion, whether the damage is internal or external, and isolated or circumferential. The electromagnetic-thickness survey measures the average casing thickness over an interval of about 0.6 m and can be used to monitor changes in thickness with time. Casing-inspection logging methods are summarized by Nielsen and Aller (1984)." EPA Web Archive: https://archive.epa.gov/esd/archive-geophysics/web/html/well_completion_logging.html

SED might provide additional future references.

SED adds the following reference, which is also included as an attachment.

1988.0101.SPWLA-1988-UU-NN

d. For each of the tools that YOU identify in response to Request 6(c), please describe YOUR understanding of the tool's efficacy in accurately identifying wall loss.

SED incorporates it's answer to question 6c by reference.

e. Identify the basis on which YOU contend that this alleged failure is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 6a.

7. YOU assert that SoCalGas did not "employ reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25" prior to the drilling of two groundwater wells which were drilled for RCA purposes (OPENING TESTIMONY, page 39).

a. Please explain what YOU believe a "reasonable understanding of groundwater depths relative to the surface casing shoe and production casing of well SS-25" would have been.

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating the groundwater depths in the question. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the question that is or was in the control of SoCalGas, and analyze it to determine what type of understanding might have been adequate.

Despite the undue burden of this question, SED requires more time to answer this question, and may endeavor to provide an additional substantive answer.

SED requires an answer to Data Request 52 Question 7 as a condition precedent to providing a complete answer to this question. For reference, that question asks:

> Identify by well number all shallow water observation wells installed at the Aliso Canyon Storage Unit. For each well, provide:
>
> a. Well Number
> b. Installation record showing at least date drilled, depth of well, depth of water from surface.
> c. All data collected and recorded from these wells.
> d. One map showing location of shallow water wells at Aliso.

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require SoCalGas to employ the understanding you explain in response to Request 7(a).

Despite, SED's objection to question 7a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. The rules include California Public Utilities Code Section 451, as identified in subsection a, which concludes on page 44 of SED opening testimony,

> By allowing groundwater to cause corrosion on the 7 inch and 11 ¾ inch casings on SS-25, SoCalGas violated Section 451. This violation begins on August 30, 1988, the date SoCalGas produced its Interoffice memo calling for inspections of the SS-25 casing, and continues to October 23, 2015, the beginning date of the incident.

The rules also include California Public Utilities Code Section 451, as identified in subsection b, which concludes on page 45 of SED opening testimony,

> SoCalGas's failure to assess the relationship between groundwater in and around the SS-25 wellsite, and the surface casing corrosion of that well on SS-25 constitute a violation of Section 451. This violation begins on August 30, 1988, the date SoCalGas produced its Interoffice Memo calling for inspections of the SS-25 casing, and continues to October 23, 2015, the beginning date of the incident.

To maintain its obligation to provide a safe system to protect employees and the public, SED expects SoCalGas will develop safe operation and maintenance standards and will implement them in the course of its normal business. These in-house procedures serve as a type of operating requirement for SoCalGas. As an example of SoCalGas not implementing its own standard, refer to SoCalGas' Company Operations Gas Standard for Pipeline Integrity - Design and Application of Cathodic Protection, SCG 186.002. This Standard was modified in 2000 to add cathodic protection for gas Storage, specifically well casings. Gas Storage management is charged with the responsibility of implementing the standard. Yet, 15 years later, well SS-25 failed from casing corrosion.

The NACE International standard practice provided in response to question 7c identifies procedures to determine the need for cathodic protection (CP) and the current requirements to achieve CP of well casings associated with oil and gas production and gas storage. It also outlines practices for the design and installation of CP systems and for their operation and maintenance. The purpose of this standard is to ensure more effective prevention of corrosion of well casings by making available reliable information about CP as it relates to well casings. This standard is intended for use by corrosion engineers in oil and gas production, especially those concerned with the CP of steel well casings. NEW REFERENCE: 2007.0101.NACE-SP0186-NN (Standard – first issued in 1986)

c. Identify and produce all DOCUMENTS, aside from the Blade Report, that support

SED's contention that SoCalGas did not employ a "reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25" prior to the drilling of the two groundwater wells which were drilled for RCA purposes.

SED adds the following reference, which is provided as an attachments: SPE-3287-MS and SPE-17930-MS

d. Identify the basis on which YOU contend that this allegation is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to questions 7b and 7c. Also, see an additional new reference: 1978.0701.PETSOC-78-03-04_NN, SPE-17930-MS

8. YOU assert that SoCalGas did not "assess the relationship between groundwater in and around the SS-25 well site, and the surface casing corrosion of that well" (OPENING TESTIMONY, page 44).

SED objects to this question because it was already encompassed by all of question 7, and answered there. Therefore, SED incorporates by reference it's answers to question 7 in response to the questions for question 8.

a. Please identify the specific actions that YOU believe SoCalGas should have taken, prior to the SS-25 leak, to "assess" the relationship between the groundwater and the surface casing.

SED requires an answer to Data Request 52 Question 7 as a condition precedent to providing a complete answer to this question. For reference, that question asks:

> Identify by well number all shallow water observation wells installed at the Aliso Canyon Storage Unit. For each well, provide:
>
> a. Well Number
>
> b. Installation record showing at least date drilled, depth of well, depth of water from surface.
>
> c. All data collected and recorded from these wells.
>
> d. One map showing location of shallow water wells at Aliso.

b. Identify the laws, rules, regulations, or industry standards that required SoCalGas to assess the relationship between groundwater around the SS-25 well site, and the surface casing corrosion around that well.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 7b, 7c, and 7d.

c. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require SoCalGas to employ the specific actions you describe in response to Request 8(a).

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question ~~8b.~~7(b).

d. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas did not "assess the relationship between groundwater in and around the SS-25 well site, and the surface casing corrosion of that well."

SED relies on the Blade Report for this violation. SED may update this answer at a later time.

See the answer to question 7b and c.

e. Identify the basis on which YOU contend that this allegation is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to question 8b.

9. YOU assert that SoCalGas had no systemic practices to protect surface casing strings against external corrosion and therefore did not employ "a proper understanding of the consequences of corroded surface casings and uncemented production casings" (OPENING TESTIMONY, page 45).

a. Please describe what YOU believe a "proper understanding of the consequences of corroded surface casings and uncemented production casings" would entail.

SED objects to this question on the grounds that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating the information identified in the question. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED further objects to this question as unduly burdensome in that it requests SED to gather information related to the information identified in the question that is or was in the control of SoCalGas, and analyze it to determine what type of understanding might have been adequate.

Notwithstanding this objection, SED notes the follows: As discussed in certain scholarly articles, "Casing integrity and cement evaluation are not new concepts, in fact operators have evaluated reservoir and well integrity since the inception of underground storage a century ago." Pg.1, Sebastian Kamgang, et al & Baker Hughes Incorporated, "Innovative Cement and Casing

Corrosion Evaluation Technologies Provide Reliable Well Integrity Information In Natural Gas Storage Wells" 2017, SPWLA 58th Annual Logging Symposium, June 17-21, 2017

As an operator of multiple gas storage areas since as early as 1943, SoCalGas should by now have a thorough understanding of the consequences of corroded surface casings and uncemented production casings. A basic understanding would be that an uncemented casing that is exposed to soil and groundwater without any protection, such as cathodic protection, will corrode and eventually leak. A proper understanding of this concept would easily lead an engineer to the conclusion that some sort of protection is necessary to avoid the maintenance costs associated with repairs or replacement of a well. For additional information, SED adds the following references: SPE-2910-MS, SPE-3287-MS and SPE-17930-MS, NACE-SP0186-NN, 1959.0519.API-59-199_NNN, 1974.0701.SPE-4682-PA_NNN, 2007.0627.SPE-108906-MS_NNN, 2007.0924.SPE-108195-MS_NNN, 2007.1111.SPE-108698-MS_NNN

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require SoCalGas to employ the understanding you explain in response to Request 9(a).

Despite, SED's objection to question 9a, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly. The rules include California Public Utilities Code Section 451, as identified on page 47 of SED's testimony, which states,

> SoCalGas violated Section 451 because it did not have systematic practice to protect surface casing strings against external corrosion, and because it did not understand the consequences of corroded surface casings and uncemented production casings. This violation begins on August 30, 1988, the date SoCalGas produced its Interoffice Memo calling for inspections of the SS-25 casing, and continues to October 23, 2015, the beginning date of the incident.

Good completion practices include the use of drilling mud with an alkaline Ph; the circulation of cement for the entire length of the casing; use of similar metals in all parts of the structure; and the insulation of the well line from the casing. See page 2, 1970.0101.SPE-2910-MS (attached). See also 7.b

c. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to employ "a proper understanding of the consequences of surface casing and uncemented production casings."

See response to 9a.

d. Identify the basis on which YOU contend that this allegation is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to questions 9a and 9b.

10. YOU assert that SoCalGas did not understand "the extent and consequences of the corrosion in other ALISO CANYON Storage wells" because of its alleged failure to investigate previous failures (OPENING TESTIMONY, page 7).

SED objects to this question because it was asked and answered. This question encompasses those that were asked already as part of this data request. See in particular, questions 1 through 6 and question 10 of this data request. This objection applies throughout the data response, and includes references to other data responses to show certain applicable data responses.

a. Please describe what YOU believe SoCalGas should have done to understand the "extent and consequences of the corrosion in other ALISO CANYON storage wells."

See responses to 6c and 9a

b. Identify the laws, rules, regulations, and/or industry standards, if any, that SED believes require SoCalGas to engage in the actions YOU explain in response to Request 10(a).

SED objects to this question because it was asked and answered.

c. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's contention that SoCalGas failed to understand "the extent and consequences of the corrosion in other ALISO CANYON storage wells."

See response to 6c and 2012.1111.SPE-161983-MS_NNN

d. Identify the basis on which YOU contend that this allegation is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answer to questions 9a and 9b.

11. YOU assert that SoCalGas "did not attempt to understand causes of the leaks at 60 wells" at ALISO CANYON (OPENING TESTIMONY, page 11).

a. Do YOU contend that SoCalGas conducted no investigation at all for the leaks mentioned above?

SoCalGas has represented to the Commission that, "The casing leaks, as SoCalGas understands them to be identified in the Blade Report, were successfully assessed and addressed by SoCalGas and, where appropriate, further investigation was performed. In order to remediate any leaks, SoCalGas necessarily had to analyze and diagnose the issue, and then implement a fix, as needed." SED reserves the right to re-visit this issue once Blade has had an opportunity to address SoCalGas's statement, and pending SoCalGas providing underlying facts to show the veracity of this statement.

Upon further review, SoCalGas did a model SIMP study to determine the condition of the casing on Frew 2 in 2014. SED reserves the right to provide further updates to this answer in the future.

b. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED's response to Request 11(a).

See response to question 11a.

c. What do YOU contend constitutes a "leak"?

A leak is any failure of the well integrity that results in a release of gas to the surrounding reservoir soil, groundwater and/or to the atmosphere. Leaks include those leaks of 60 wells at Aliso Canyon, as identified by the Blade Report at page 4, as mentioned in footnote 42 of SED's opening testimony. See also page 9 of SED's testimony, which says,

> To avoid double counting violations, SED assumes that the 60 leaks identified before the Aliso Canyon incident included the six blowouts and parted casings identified above. As such, the remaining 54 leaks that went without investigation should constitute a separate set of up to 54 violations. At the latest, these violations began on October 22, 2015, the last possible date before the incident on October 23, 2015.

d. Please describe what actions YOU believe are necessary for a reasonable investigation of a leak.

SED objects to this question in that it mischaracterizes SED's testimony, and related role as the entity that is responsible for investigating leaks on SoCalGas's system. That is SoCalGas's (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451. SED reserves the right to investigate and audit SoCalGas for safety related purposes.

SED also objects to this question as vague and overly broad. This question would have SED provide an up front commitment to what constitutes a necessary investigation of a leak for every instance without having the facts associated with a given leak, thereby potentially compromising the ability of SED's investigators to do their work when investigating leaks for safety related purposes.

Notwithstanding these objections, please refer to the responses to 6c, 9a and 10c

Please also see Blade's Response to SED Data Request 49, Questions 3 through 5. For context, these responses are replicated here.

2.3 Question 3

Does Blade agree with the statement that, "The Blade Report fails to recognize, however, that a 'formal investigation' of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well, nor necessary. While Blade was able to cut, extract, and thoroughly examine the casing at well SS-25 because there were plans to abandon the well, it is not feasible for SoCalGas to perform the same level of failure analysis on active gas storage wells."

2.3.1 Response 3

Blade disagrees with the statement.

2.4 Question 4

If Blade agrees with the statement in question 3, please explain why.

2.4.1 Response 4

See Response 5.

2.5 Question 5

If Blade disagrees with any portion or all of the statement in question 3, please explain why it disagrees.

2.5.1 Response 5

Solution 6: Conduct a Casing Failure Analysis from the Blade Main Report, Section 5.3.1, Page 232, is replicated here for reference.

Solution 6: Conduct a Casing Failure Analysis

Despite numerous casing failures, no data were provided to indicate that failure causes were investigated. Casing failures need to be formally investigated so that their causes are identified and their implications are understood. Understanding and interpreting failures are critical to defining the propensity or risk of such failures field wide. Such analysis is an important part of any risk assessment. The cause may be straightforward, well specific, and easily mitigated. However, if the cause appears to systemic, or the potential consequences are serious, then a more comprehensive investigation is needed to evaluate the potential risks to other wells in the field so that the appropriate mitigation steps are taken. For example, failure investigation of casing OD corrosion in another well might have directed attention to SS-25 and other similar wells. Running an inner string or plugging a well are valid mitigations, but prior to such actions, the cause of the casing leak or failure should be understood. **The type of investigation should be commensurate with the risk and consequence of the failure, and should be part of the well integrity management system.**

As stated in Solution 6, the last sentence; "The type of investigation should be commensurate with the

risk and consequence of the failure, and should be part of the well integrity management system." It is understood that all failures cannot be treated like SS-25, nor should they. The level of investigation depends on many things including the depth of the failure. It may not be feasible, practical, or necessary, to recover production casing from a deep leak. However, inspection and diagnostic tools are available to determine the nature of the failure, such as, a hole, corrosion—internal or external over a large or small area, location of a failure—pipe body or connection, etc. Such data should be integrated and analyzed to assess the possible causes and develop some hypothesis that can be used to evaluate other wells with failures. Once the failure has been evaluated and understood, the appropriate steps can be taken to determine the disposition of the well. The well can be repaired (inner strings, etc.) or plugged and abandoned if not repairable or if the well is no longer needed. SoCalGas did repair wells or plugged and abandoned wells after the failures were identified.

e. Identify the laws, rules, regulations, and/or industry standards, if any, that YOU believe require SoCalGas to engage in the actions YOU describe in response to Request 11(d).

Despite, SED's objection to question 11d, SED understands this to be asking about the information from SED's testimony that is identified in the question, and answers accordingly.

SED's testimony on pages 8 and 9 state in part,

SED views SoCalGas's failure to investigate or analyze the failures or root causes of casing leaks, parted casings, or other failure events as separate violations of Section 451, as follows. . .

> To avoid double counting violations, SED assumes that the 60 leaks identified before the Aliso Canyon incident included the six blowouts and parted casings identified above. As such, the remaining 54 leaks that went without investigation should constitute a separate set of up to 54 violations. At the latest, these violations began on October 22, 2015, the last possible date before the incident on October 23, 2015.

In addition, See API RP 585, as identified in Blade's data response to SED Data Request 49, Question 6, which is replicated below for context.

2.6 Question 6
With regards to the statement, that, "a 'formal investigation' of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well. . .", what levels of
examination are feasible for an active well that SoCalGas could have performed in Blade's opinion?

2.6.1 Response 6
This is addressed by Solution 7: Regulations Should Require a Level 1 (Per API RP 585) Analysis of All Failures in the Blade Main Report, Section 5.3.1, Page 232, replicated here for reference.

Solution 7: Regulations Should Require a Level 1 (Per API RP 585) Analysis of All Failures API RP 585 Pressure Equipment Integrity Incident Investigation, discusses failure investigation of pressure equipment [2]. The Aliso Canyon wells are a form of complex pressure vessels. A Level 1 type analysis of failures, as a minimum requirement, will identify the immediate causes of the failures or near misses and allow operators to understand the implications, if any.

Figure 8 shows the different levels of investigation as discussed in RP 585. A Level 1 investigation may be appropriate for most casing failures and can be done quickly with no disruption to field operations. API RP 585 was developed for Pressure Equipment Integrity Incident Investigation; however, Blade presents this as an option that could be applied to Gas Storage Well Integrity Management.

	Level 1 Investigations	Level 2 Investigations	Level 3 Investigations
Incident Characteristics	— Unexpected condition or damage found that if it had been allowed to progress would have led to loss of containment before the next scheduled outage or inspection interval. — Discovered PEI damage significantly beyond expectation but with no loss of containment or unit shutdown. — Small leaks (other than environmental fugitive emissions) from pressure equipment or joints that were easily contained. — Typically no fire, significant toxic release, injuries, or environmental damage would occur in a Level 1 incident.	— Leak from pressure equipment that resulted in or could have resulted in localized equipment damage, small to medium size release quantity, or small safety or environmental damage. — Unexpected pressure equipment failure from damage mechanisms or structural deterioration. — Unexpected pressure equipment damage or associated structural damage discovered that required equipment or unit shut down or immediate mitigation. — Repetitive Level 1 type characteristics in the same process or system.	Leak or rupture from pressure equipment that resulted in or could have resulted in significant process safety incident or environmental damage, equipment damage, large release quantity, or production loss.
Investigation Characteristics	Investigate using less structured analysis tools such as "What If" or "5-Whys." Uses evidence, judgment, and experience to identify causes.	Investigate using company or department causal factor identification or logic trees, seeking probable contributing and root causes.	Investigate using company structured root cause analysis (RCA) seeking to determine the deepest management system and cultural causes.
Team Makeup Recommended	Investigated by the PEI personnel from the affected area and trained in simple investigation techniques. Can be investigated by one person, possibly two. Involve subject-matter experts (SMEs) as needed.	Leader would be someone from the affected area trained in investigation techniques. Team members would include one to three others of different disciplines from the area; include at least one PEI person on the team. Involve SMEs as needed.	Leader would be someone trained in structured RCA and from another area of the plant or another business unit. There would be at least three team members and possibly from different disciplines or groups, such as inspection, operations, process engineering, maintenance, or process safety. Appropriate SMEs should be included on the team.
Initiation	Within a few days.	Begin investigation as soon as practical (e.g. 1 to 2 days).	Begin freezing and collecting evidence as soon as practical (e.g. within a few hours).
Sponsorship	Supervisor of investigator (First Line Supervisor).	Department Head level (Second Line Supervisor).	Management with overall responsibility for Safety Health Environment for the site.

Figure 8: API 585 Inspection Levels

Failed casing in an active well can be analyzed using casing wall thickness inspection, downhole camera, and other diagnostic tools as discussed in Section 2.2.1 Response 2. This may provide data that can be used to interpret causes for the casing failure.

f. Identify the basis on which YOU contend that this allegation is a violation of Section 451.

The basis for this violation is provided in Section II.B of SED's opening testimony. See also the answers to the other parts of Question 11.

12. YOU assert that the Aliso Canyon storage wells had "numerous casing leaks" and assert

that these leaks “may have been relevant to the conditions at SS-25.” (OPENING TESTIMONY, page 7).

a. Describe how each of the alleged “numerous casing leaks” were “relevant to the conditions at SS-25.”

SED objects to the request to describe how each of the alleged numerous casing leaks were relevant to the conditions at SS-25 as unduly burdensome. SED further objects to this question as mischaracterizing SED's testimony. SED stated that the leaks "may have been relevant to the conditions at SS-25", not that they "were" relevant. SED answers this question with the understanding that SoCalGas meant to replace the term "were" with "may have been".

The numerous casing leaks at the Aliso Canyon storage wells may have been indicators that other wells at the storage facility, including well SS-25, were also likely to experience leaks, as well as threats related to leaks, including the documented corrosion that the casing of well SS-25 had. While the Aliso field is geologically complex, except for recently drilled wells, all of the wells were constructed in the same time period of similar materials and are exposed to similar environmental and gas quality conditions. Specifically, the inclusion of SS-25 with other wells on a 1988 list for evaluation and the 2014 finding in the SIMP study of FREW 2 that the casing had numerous leaks, should have been sufficient information to cause SoCalGas to look more closely at SS-25 for corrosion or other causes of leaks.

b. Identify and produce all DOCUMENTS, aside from the Blade Report, that support SED’s contention that the “numerous casing leaks” “may have been relevant to the conditions at SS-25.”

SED relies on the Blade Report for this violation. SED may update this answer at a later time.

In the 2014 evaluation of FREW 2, there was clear evidence of external corrosion which should have raised an immediate concern for other wells exposed to similar conditions. Corrosion was extensive, including 82% loss with 0% remaining strength. See SoCalGas’s Data Response to SED Data Request 25.

SED requires an answer to Data Request 52 Question 9 as a condition precedent to providing a complete answer to this question. For reference, that question asks:

> In addition to the SIMP Model Studies performed in 2014 on FREW 2, identify all other similar studies performed on other Aliso wells prior to October 23, 2015. For each study identified, provide a complete copy of the resulting report(s) that present log interpretations and results. Each report should be provided in separate, searchable pdf document(s).

13. Do YOU contend that SoCalGas has or had authority to compel Daniel Clayton of

BOOTS AND COOTS to appear for an examination under oath in response to the SUBPOENAS? If so, state all facts, reasons, and grounds upon which YOU base YOUR contention.

SED objects to this question as vague in that it does not identify the page number or passage of SED's testimony that it is questioning. SED further objects to this question to the extent that it calls for legal conclusion with regards to SoCalGas's authority to compel Mr. Clayton to appear for examination under oath.

SED further objects to this question on the grounds that SoCalGas has asked SED to provide a legal justification for one of its asserted violations, which SoCalGas agreed it would not do in the pre-hearing conference.
SoCalGas's position was that SED should identify alleged violations with specificity in opening testimony. SED identified a concern that SoCalGas not cross-examine SED's witnesses as lawyers for concluding that there was a violation, and SoCalGas voiced no objection to this concern. SED has now proceeded in reliance on SoCalGas's assurance on the record that it would not cross-examine SED's witnesses for identifying the legal justifications for alleged violations in testimony, but this question does exactly that. For context and reference, SED quotes the pertinent portion of the transcript here.[1]
The next question concerns the deadline for SED to submit alleged violations and the factual and legal justifications for each alleged violation.· My question is whether it would be reasonable to set a deadline of opening testimony for SED to submit alleged violations, and the factual justifications for each alleged violation, and set a deadline of opening briefs for SED to submit the legal justifications for its alleged violations?
Would any party like to respond to my question?· SoCalGas.
MR. STODDARD:· SoCalGas's position on this is that SED should identify the alleged violations with specificity in its opening testimony sooner, if possible; but in its opening testimony would be acceptable to SoCalGas as we had proposed in our prehearing conference statement.
MR. SHER:· Your Honor, SED would not necessarily be opposed to such if SoCalGas agreed now that it would not waste time cross-examining SED's witness as to their legal basis for tying violations to code sections, et cetera.
ALJ KENNEY:· Does SoCalGas have a response at this time?
MR. STODDARD:· SoCalGas is not going to waive any rights to cross-examination. Although, I would ask for clarification what exactly is meant by "legal basis" here?
MR. SHER:· The way your Honor set this out is that the violations would be set forth in the opening, and then the legal issues would be discussed in the briefing. To the degree -- it is highly unlikely that SED's witness will be a lawyer.· So we don't want SoCalGas, if we are going to do this all in our opening testimony, to cross-examine the witness as to their legal basis for concluding that this is a

[1] See I.19-06-016, Pre-hearing conference transcripts, pp. 43 : 11 to 44 : 28.

violation, for example, of 451.
MR. STODDARD:· SoCalGas does not object to that.
ALJ KENNEY:· Thank you.

14. Do YOU contend that SoCalGas has or had authority to compel Mike Baggett of BOOTS AND COOTS to appear for an examination under oath in response to the SUBPOENAS? If so, state all facts, reasons, and grounds upon which YOU base YOUR contention.

SED objects to this question as vague in that it does not identify the page number or passage of SED's testimony that it is questioning. SED further objects to this question to the extent that it calls for legal conclusion with regards to SoCalGas's authority to compel Mr. Baggett to appear for examination under oath. SED incorporates the entirety of its objection on legal conclusion grounds in response to question 13 here.

15. Do YOU contend that SoCalGas was legally obligated to include a term in its STANDARD SERVICES AGREEMENT with BOOTS AND COOTS that required BOOTS AND COOTS to subject itself to the same provisions to cooperate with SED's pre-formal investigation that SoCalGas was required to follow? If so, state all facts, reasons, and grounds upon which YOU base YOUR contention.

SED objects to this question as vague in that it does not identify the page number or passage of SED's testimony that it is questioning. SED further objects to this question to the extent that it calls for legal conclusion with regards to the legal obligations that SoCalGas had to include one or more terms in its STANDARD SERVICES AGREEMENT with BOOTS AND COOTS.
SED incorporates the entirety of its objection on legal conclusion grounds in response to question 13 here.

16. Do YOU contend that SoCalGas was legally obligated to include a term in its STANDARD SERVICES AGREEMENT with BOOTS AND COOTS that required BOOTS AND COOTS to respond to investigation-related inquiries from SED and/or Blade? If so, state all facts, reasons, and grounds upon which YOU base YOUR contention.

SED objects to this question as vague in that it does not identify the page number or passage of SED's testimony that it is questioning. SED further objects to this question in that it calls for a legal conclusion, asking for SED's views as to legal obligations of SoCalGas and requirements of Boots and Coots.
SED incorporates the entirety of its objection on legal conclusion grounds in response to question 13 here.

17. Do YOU contend that YOU have or had jurisdiction over the contractors that SoCalGas engaged to perform services in connection with responding to the ALISO CANYON leak? If not, do YOU contend that including the provision noted on page 58 of the OPENING TESTIMONY (i.e., a provision that required the contractor "to subject itself

to the same provisions to cooperate with SED's pre-formal investigation that SoCalGas itself was required to follow") would have conferred upon YOU such jurisdiction over SoCalGas' contractors?

SED objects to this question in that it calls for a legal conclusion with respect to whether SED has had or does have jurisdiction over SoCalGas's contractors.
SED incorporates the entirety of its objection on legal conclusion grounds in response to question 13 here.

18. Identify all actions YOU believe SoCalGas should have taken to compel BOOTS AND COOTS personnel to comply with YOUR SUBPOENAS.

SED objects to this question in that it calls for a legal conclusion with respect to steps SoCalGas should have taken to compel Boots and Coots personnel to comply with SED's subpoenas.
SED incorporates the entirety of its objection on legal conclusion grounds in response to question 13 here.

19. Identify and produce all DOCUMENTS evidencing service of YOUR SUBPOENAS on BOOTS AND COOTS.

SED served subpoenas on SoCalGas to produce Boots and Coots, but not on Boots and Coots directly.

20. Identify all actions YOU took to compel BOOTS AND COOTS personnel to comply with YOUR SUBPOENAS.

SED served SoCalGas with subpoenas to produce Boots and Coots, but did not subpoena Boots and Coots personnel directly.

21. Identify the basis on which SED contends that the lack of terms in the STANDARD SERVICES AGREEMENT as discussed in Requests 15 and 16 is a violation of Section 451.

SED objects to this question as ambiguous and vague in that it does not identify the page number or passage of SED's opening testimony to which it is referring. SED further objects to this question as vague and ambiguous in that it does not clarify what "Requests 15 and 16" means, and does not clarify the passages to which the question is referring. If SED receives clarification, SED reserves the right to object to this question to the extent It calls on SED to make a legal conclusion. SED incorporates the entirety of its objection on legal conclusion grounds in response to question 13 here.

22. Produce all DOCUMENTS reflecting COMMUNICATIONS between YOU and BOOTS AND COOTS.

SED objects to this question as unduly burdensome on the grounds that it asks for extensive communications that could take extensive man hours to prove that there is not a single communication that SED has not turned over. Also because of undue burden on SED, SED does not understand this request to include those documents that SoCalGas forwarded from Boots and Coots to SED, or from SED to Boots and Coots. SED further objects to this request as vague and overly broad, asking for all communications between SED and Boots and Coots; not merely those that are within the scope of this proceeding.

Notwithstanding these objections, to the best of SED's knowledge at this time, SED has already produced to SoCalGas all documents reflecting communications between SED and Boots and Coots related to the instant proceeding. These include the Examination Under Oath transcripts of Mr. Danny Walzel and Mr. Mike Kopecky.

23. YOU assert on page 70 of YOUR OPENING TESTIMONY that "Data in the SS-25 file reveals an ongoing detection of leaks at the bottom of the well." Identify the specific data that YOU contend reveals an ongoing detection of leaks.

The specific data is provided In the Bates numbers shown in footnote 443 of SED's opening testimony; SS-25 Well File, Supporting Attachments SED 01774-01778, 01804-01810,[2] and 01894-01895.

24. YOU assert on page 72 of YOUR OPENING TESTIMONY that "The Well File for SS-25 is not kept in any particular order. Typically, such a file would be maintained in chronological order." State all facts, reasons, and grounds upon which YOU base YOUR assertion that gas storage well files are typically maintained in chronological order.

This statement is based on the condition of the well file provided in response to SED DR 1, which was a series of single page Pdf documents. SED assumes this first rendition of the file was a perfect copy of the files in the order in which they appeared in the SoCalGas well file on or about October 23, 2015. If this assumption is correct, the well file lacked any discernable order. And in comparing the SS-25 file with the similarly produced SS-25A and 25B well files, there appears to be documents missing from the SS-25 well file, such as Inter-Office memos that might address the ongoing indications of one or more leaks on temperature surveys and any proposed actions or maintenance actions. The SS-25 well file is also missing basic geologic and reservoir data that would normally be acquired during drilling or logging.

SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

25. YOU assert on page 74 of YOUR OPENING TESTIMONY that "SoCalGas records do not show operating records that would be reasonable to keep and mirror typical record

[2] SED's opening testimony states 018010. This is a typo, and is corrected to say 01810.

retention policies in the industry."

a. Identify all "record retention policies" that you contend are typical in the gas storage industry.

SED objects to this question as unduly burdensome. Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

SoCalGas has a record retention policy dated November 30, 2013 that identifies the gas storage records to be kept for the life of the asset plus 5 years. See AC_CPUC_SED_DR_17_000024-25. To date, SoCalGas has not demonstrated to a reasonable degree that it kept all of these records for the Aliso Canyon Storage Facility. Records produced fail to show any organization such that the records would be readily accessible to those who need to access them, especially in the event of an emergency.

Examples of other industry record retention policies are provided as attachments. These policies include references to governing laws and regulations, which SoCalGas can obtain separately through its own library or law office.

1986.0601.GTR0004210_SP_210.4-4_Records_retention.pdf (Redacted)
GasTransmissionSystemRecordsOII_DR_CPUC_023-Q26Atch08_REDACTED.pdf
Pages 34-35.PG&E.P2-2-Guide.to.Record.Retention-2003.pdf (Redacted)

b. Did SED ever conduct an audit of SoCalGas relating to whether SoCalGas had record-keeping procedures that were "reasonable" or "mirror[ed] typical retention policies in the industry."

SED objects to this question as unduly burdensome. SoCalGas is the subject of all SED audits identified in the question, and has the information regarding whether it was the subject of any such audits. SED reminds SoCalGas to avoid wasting limited SED staff time with questions to which SoCalGas does or should demonstrably have the answer.

c. Produce all DOCUMENTS regarding "typical record retention policies in the industry."

See attached in response to 25.a.

SED objects to this question as unduly burdensome in asking for SED to produce all such typical record retention policies in the industry because SoCalGas should also have such information. Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

26. YOU assert on page 68 of YOUR OPENING TESTIMONY that "This failure to maintain basic records led to the inability to maintain wells in safe conditions and to supply critical operating data in response to emergencies."

a. Identify all instances in which YOU contend failure to maintain basic records by SoCalGas "led to the inability to maintain wells in safe conditions." For each such instance, identify the relevant well and record.

SED requires an answer to Data Request 52 Questions 1, 3, 4, 5, 6, 7, 8 and 9 as a condition precedent to providing a complete answer to this question.

b. Identify all instances in which YOU contend failure to maintain basic records by SoCalGas "led to the inability… to supply critical operating data in response to emergencies." For each such instance, identify the relevant well and record.

SED objects to this question as unduly burdensome in that it requests SED to gather information related to the question that is or was in the control of SoCalGas, and analyze it to determine what type of whether failure to maintain basic records by SoCalGas led to the inabilities identified in the question.

Despite the undue burden of this question, SED replies: Please refer to page 131 of the Blade Main Report, March 16, 2019, where Blade Identifies the difference between its determination of the Bottom Hole Pressure ("IPR") compared to the significantly lower pressure SoCalGas gave to DOGGR and the national laboratory for well kill calculations. For further analysis of the results of this difference, see the Blade Report. Records used by Blade for development of the BHP are discussed on pages 128-130 of the Blade Main Report. This discussion points out the problems with some historical data provided to Blade. But, at the basic level, SoCalGas had no current record of the BHP for SS-25, or for the reservoir when Well-SS-25 failed.

Supplementing the above statement. SoCalGas severely underestimated the Reservoir Pressure. (See Blade Vol 3. SS-25 Transient Well Kill Analysis, pp. 10 and 16.) In addition, SoCalGas used an incorrect gas flow of 30 MMscf/D, which should have been in the range of 80 to 93 MMscf/D. SoCalGas' own historical data showed well flow in excess of 80 MMScf/D. (see Blade Vol. 3 SS-25 Transient Well Kill Analysis, p. 37.) These Incorrect figures were apparently used by SoCalGas and Boot & Coots in developing kill procedures that failed. While SoCalGas did not produce evidence of utilizing models prior to kill attempt 7, SED assumes SoCalGas and its contractors, at a minimum, performed calculations to determine the ppg of fluid and pump pressures it would use in each kill attempt. Reservoir pressure, bottom hole pressure and well flow are critical factors in making such calculations. Underestimating these numbers led to repeated well kill failures.A responsible gas stororage operator should have current records that accurately reflect these critical operating data and those records should be readily available to engineering and operating personnel. SoCalGas failed in this respect, creating an

unsafe situation in which conditions at Well SS-25 could not be fully controlled by personnel and where an estimated 120,000 metric tons of methane were released into the atmosphere from the end of October 2015 to early February 2016.

SED requires an answer to Data Request 52 Questions 1, 3, 4, 5, 6, 7, 8 and 9 as a condition precedent to providing a complete answer to this question.

c. Identify the basis on which YOU contend that this alleged failure is a violation of Section 451.

SED objects to this question on the grounds that it mischaracterizes SED's testimony. SED does not use this point as the violation of Section 451. Instead, the violations are identified at the end of the section in which this sentence is found. Namely, the recordkeeping related violations in this section are articulated on SED opening testimony page 75, and state,

> In conclusion, SoCalGas' imprudent and unreasonable record keeping practices violated Section 451 three times; once for well SS-25, a second time for well SS-25A, and a third time for well SS-25B. The violation associated with well SS-25 begins June 6, 1973, the date that SoCalGas hydrotested their gas conversion of well SS-25. The violation associated with well SS-25A began December 7, 1972, the date that well SS-25A became operational according to DOGGR records. The violation associated with well SS-25B began October 29, 1973, the date that well SS-25B became operational according to DOGGR records.
>
> Each of these three violations end on October 23, 2015, as safety records in Well Files SS-25, SS-25A and SS-25B appeared to be missing up through the date of the well SS-25 incident.

27. YOU allege that SoCalGas knew that SS-25 released both crude oil and natural gas during the ALISO CANYON incident, but "did not disclose this fact to the Los Angeles County Department of Health." (OPENING TESTIMONY, page 51).

a. Identify all actions taken by YOU to independently verify the claims alleged by the California Department of Public Health ("DPH").

SED objects to this question on the grounds that it is unduly burdensome and overly broad, requiring SED to identify all actions it took to independently verify the claims alleged by DPH.

Notwithstanding these objections, SED requires more time to answer this question, and reserves the right to update its answer.

b. Confirm or deny that YOU considered SoCalGas' March 21, 2019 response letter to

the DPH when preparing YOUR OPENING TESTIMONY.

SED objects to this question to the extent it requests information that is protected by attorney-client and work product privileges. Without waiving these privileges, the answer is yes, as shown in SED's opening testimony on pages 51 and 52. Specifically, the passage in SED's testimony that shows SED considered SoCalGas's response letter to DPH states,

"SoCalGas responded to the Department of Public Health asserting 'For all the above reasons, your suggestion that SoCalGas somehow withheld information or was otherwise not fully transparent with respect to the components of natural gas released during the incident, and your statements concerning DPH's ability to perform a health assessment, are simply incorrect.'" SED's testimony references the March 21, 2019 letter in footnotes 383 and 384 of its opening testimony, which are cited in this passage.

c. Produce any and all COMMUNICATIONS by and between SED and the DPH, from October 23, 2015 through and including December 6, 2019.

SED objects to this question on the grounds that it requests information that is protected by the common interest privilege.

d. Produce any and all internal CPUC COMMUNICATIONS concerning DPH related to ALISO CANYON, from October 23, 2015 through and including December 6, 2019.

SED objects to this question on the grounds that it requests information that is protected by attorney client and work product privileges. SED also objects to this question on the grounds that it is unduly burdensome.

28. YOU allege that SoCalGas "did not have a well specific, well control plan that considered transient kill modeling or well deliverability. There was not quantitative understanding of well deliverability, although data were available, and well-established industry practices existed for such analysis." (OPENING TESTIMONY, page 28).

a. Identify the "well-established industry standards" you reference on page 28 of YOUR OPENING TESTIMONY.

SED objects to this question as mischaracterizing its testimony, which uses the term "well-established industry practices"; not "well-established industry standards". SED understands the question to be asking about "well-established industry practices", and will answer the question with this understanding.

This statement is based upon excerpts quoted from the Blade Report, pages 5 and 238.

b. Identify and produce all DOCUMENTS, aside from the Blade Report, that include or

reference the “well-established industry standards” you identify in response to Request 28(a).

SED further objects to this question as unduly burdensome in that it requests SED to gather all documents that include well-established industry standards.

Despite the undue burden of this question, SED requires more time to answer this question, and reserves the right to provide an additional substantive answer.

For reference to "simulations," a term used before "modeling" but essentially the same thing, refer to Donald L. Katz, AIME, U. of Michigan, "Monitoring Gas Storage Reservoirs," June 10, 1971, SPE PAPER No. 3287.

c. Identify the basis on which YOU contend that this allegation is a violation of Section 451.

SED objects to this question as mischaracterizing its opening testimony. The violations in this section are identified in this section on pages 38 and 39, and are quoted here.

> Given that SoCalGas had no well kill control plans and there are no data indicating transient modeling -- any modeling -- or analysis conducted to design the second through sixth well kill attempts, and such modeling would have provided the necessary information to successfully kill the well, SoCalGas violated Section 451.
>
> The Section 451 violation began November 13, 2015, the day SoCalGas unsuccessfully executed the second well kill attempt without modeling, and continued through February 11, 2016, the date of the successful relief well kill attempt. Because the second through sixth well kill attempts should have been successful with proper modeling, shareholders should be required to pay all expenses associated with each one. Also, because the relief well was started on December 4, 2015, after the second well kill attempt, the relief well would not have been needed had the second well kill attempt been properly modeled. As such, shareholders should be required to pay all expenses associated with the relief well. SoCalGas’s failure to provide well kill programs for relief well #2, well SS-25A and well SS-25B each constitute one violation of Section 451, for a total of three violations. Each of these violations span from November 13, 2015, the date
> SoCalGas unsuccessfully executed the second well kill attempt, to February 11, 2016, the date of the successful relief well kill attempt.
>
> Because surface plumbing failures prevented the well from being kept filled and the wellhead and surface casing were structurally unstable by kill attempt 6,276 such damage appears to have resulted from the prior unsuccessful kill attempt, thereby compromising the ability of kill attempt 7 to kill the well and end the safety

consequences of the SS-25 leak. According to Blade, pumping for kill attempt 7 was terminated due to rocking of the wellhead and a subsequent failure of the injection connection. In other words, the ability to succeed on the seventh kill attempt was impaired by at least certain of the prior unsuccessful kill attempts, which should have been successful. This is a violation of Section 451.

The apparent conservative start date of this violation is November 25, 2015, the date that well kill attempt #6 was made. This violation continued until February 11, 2016, the date of the successful relief well kill attempt.

The basis for these violations is provided in the SED's opening testimony, Section II.B.5, pages 28 to 39.

29. YOU allege that the Division of Oil, Gas and Geothermal Resources ("DOGGR") responded to a 1994 SoCalGas proposal by stating, in part, "'Therefore, the monitoring program and static temperature surveys currently used by the Gas Company could be used to satisfy compliance of the requirements for mechanical integrity found in this section [California Code of Regulations Section 1724.10(k)(5)].'" (OPENING TESTIMONY, page 15). Do YOU disagree that DOGGR affirmatively stated that SoCalGas' activities complied with the cited regulation? If so, identify all grounds for your position.

SED's position is precisely that from SED testimony page 15, which SoCalGas quoted in the question. The grounds for the position is shown in the quote, and based upon the Blade Report at page 198, as cited in footnote 75.

30. Do YOU contend that YOU have authority to fine utilities for actions that are not within SED's regulatory purview, but instead are regulated exclusively by DOGGR?

SED objects to this question on the grounds that it calls for a legal conclusion as to SED's authority and SED's regulatory purview, as well as the exclusive regulatory purview of DOGGR. SED further objects to the question as argumentative, that it assumes facts not in evidence, that it mischaracterizes SED's testimony, that it is vague and ambiguous in that it fails to provide context, vague as to time, and that it is overly broad.

31. Provide all contracts SED is aware of between underground gas storage operators, entered into during an emergency situation, that include a provision requiring the contractor to subject itself to the same provisions to cooperate with an investigation, by a regulator that has no jurisdiction over the contractor, as the principal.

SED objects to this question as vague in that it does not reference a page of SED's testimony; vague as to time; overly broad in asking for SED's awareness of all underground gas storage operators, including those not regulated by the Commission; and unduly burdensome.

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SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-90 DATED MAY 12, 2020)

SOCALGAS RESPONSE DATED MAY 29, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated May 12, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

For this Data Request, please refer to the document entitled, "Chapter I Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company".

QUESTION 1.a:

Please refer to page 3, lines 5-10, which states,

"In addition, Mr. Stinson served on the American Gas Association Underground Gas Storage committee for over 20 years, including one year as its chairman. This committee served as a platform for gas storage operators to share emerging technologies, current industry standard practices, development and operating challenges, regulatory changes, and a host of other issues facing their companies."
With this passage in mind, please answer:

a. In Mr. Stinson's American Gas Association experience, what were the general subject matters of "emerging technologies shared by gas storage operators on the AGA Committee"?

RESPONSE 1.a:

SoCalGas objects to this request to the extent it is overly broad and unduly burdensome, particularly to the extent it fails to specify a time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds to the request as follows. The emerging technologies discussed by the Underground Gas Storage Committee during Mr. Stinson's tenure included: 1) Wireless solar powered wellhead data collection devices; 2) Updated well logging tools and techniques; 3) Wellhead valve design and testing; 4) Horizontal well drilling technology for injection/withdrawal wells; 5) Gravel packed completions for high deliverability; 6) Use of downhole cameras for detecting obstructions and/or damage; and 7) Hydrate control using various chemicals and techniques.

QUESTION 1.b:

What was the specific name of the American Gas Association Committee?

RESPONSE 1.b:

SoCalGas objects to this request to the extent it seeks information already provided to SED and is included in the question. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The American Gas Association Underground Gas Storage Committee.

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SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-90 DATED MAY 12, 2020)

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QUESTION 1.c:

Did emerging technologies have to do with horizontal gas wells that involve fracking?

RESPONSE 1.c:

SoCalGas objects to this request as vague and ambiguous, and unintelligible with respect to the phrase "have to do with." SoCalGas further objects to this request as outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 29, 2019. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Not that Mr. Stinson recalls.

QUESTION 2.a:

Please refer to page 3, lines 12-16, which states,

"II. GENERAL DISCUSSION REGARDING INDUSTRY STANDARDS AND SOCALGAS' OPERATIONS
In considering whether SoCalGas acted reasonably with respect to operation and maintenance of the Aliso Canyon gas storage field prior to the 2015 Aliso Canyon incident it is necessary to assess the relevant industry standards that applied at the time."

a. With regards to this passage, does Mr. Stinson view emerging technologies about gas wells that are fracked to be relevant to industry standards that applied at the time in considering whether SoCalGas acted reasonably with respect to operation and maintenance of the Aliso Canyon gas storage field prior to the 2015 Aliso Canyon incident?

RESPONSE 2.a:

SoCalGas objects to this request to the extent it is vague and ambiguous, and unintelligible particularly with respect to the phrase, "emerging technologies about gas wells that are fracked to be relevant to industry standards that applied at the time." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

QUESTION 2.b:

If the answer to 2.a is Yes, please identify all subject areas about fracked gas wells that are also relevant to the drilling, operation and maintenance of Aliso Canyon Wells.

RESPONSE 2.b:

N/A.

QUESTION 3:

Please refer to the portion of page 3, Line 11 that states: "Mr. Stinson has toured over 30 gas storage fields in 13 states."

With this passage in mind, please answer: How does touring 30 gas storage fields provide Mr. Stinson with experience relevant to the issues that are subject of his testimony?

RESPONSE 3:

SoCalGas objects to this request on the grounds it is vague, ambiguous and unintelligible. SoCalGas further objects to this request on the grounds that it is asking SoCalGas to restate witness qualifications previously provided in testimony. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Mr. Stinson's observations during these visits, and interactions with operators, informed Mr. Stinson's understanding of industry standards. During these visits, Mr. Stinson talked to operators and gained knowledge of what they were doing at their sites and how they were managing their wells. These visits included working meetings where Mr. Stinson was onsite in his capacity as a member of the AGA as well as visits where Mr. Stinson was working as an engineer in a professional capacity.

QUESTION 4a:

Please refer to page 3 line 20 to page 4, line 1, which states:

"Prior to September 2015 and the publication of API Recommended Practice ("RP") 1171 ("API RP 1171"), "Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs," there were no documented gas storage industry-wide

procedures that would have been considered industry standard practice." This passage ends in a footnote that states, "For purposes of this testimony 'industry standard practice' means prevailing practice within the industry."

With this passage in mind, please answer the following:

a. Why do Messrs. Hower and Stinson state that "there were no documented gas storage industry-wide procedures that would have been considered industry standard practice" prior to September 2015?

RESPONSE 4.a:

SoCalGas objects to this request on the ground it is unintelligible. SoCalGas further objects to this request on the grounds that it is asking for information previously provided in SoCalGas' Reply Testimony, Chapter I (Hower/Stinson). Subject to and without waiving the foregoing objections, SoCalGas responds as follows. As explained in the SoCalGas Reply Testimony, Chapter I (Hower/Stinson), at pp. 3-4, prior to the publication of API RP 1171, there were no documented gas storage industry-wide procedures that would have been considered industry standard practice for natural gas storage in depleted hydrocarbon reservoirs.

QUESTION 4.b:

Provide all documents in SoCalGas', Mr. Hower, and/or Mr. Stinson's possession that support this statement.

RESPONSE 4.b:

SoCalGas objects to this request as overly broad and unduly burdensome. SoCalGas further objects to this request on the ground it is unintelligible in that it is asking for documents proving that documents do not exist. SoCalGas further objects to this request to the extent it assumes that Mr. Hower's and Mr. Stinson's statement is based solely on documents. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see, e.g., attached documents I1906016_SCG_SED_DR_90_0000001 – I1906016_SCG_SED_DR_90_0000088 and I1906016_SCG_SED_DR_90_0029129 - 29291.

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QUESTION 4.c:

What steps did Messrs. Hower and Stinson take (including research) in preparing their testimony to verify that there were no documented gas storage industry-wide procedures that would have been considered industry standard practice prior to September 2015?

RESPONSE 4.c:

SoCalGas objects to this request to the extent it is argumentative. SoCalGas further objects to the phrase "what steps did Messrs. Hower and Stinson take" as vague and ambiguous. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Messrs. Hower and Stinson based their testimony on their more than 75 years of collective professional experience described in their testimony. Additionally, Messrs. Hower and Stinson performed a review of state regulations in states with underground gas storage operations as well as a review of available documents from the American Gas Association, the American Petroleum Institute, the Society of Professional Engineers and other sources.

QUESTION 5.a.i:

Please refer to the table on pages 4 through 6 (Table).

a. Please refer to the column on the table titled "Industry Standard Practice as of 10/23/2015."

i. On Line 1, Maximum Operating Reservoir Pressure, how did Mr. Stinson calculate the 36%?

RESPONSE 5.a.i:

Mr. Stinson calculated the Maximum Operating Reservoir Pressure by analyzing a 2001 Delta Pressure Study, which included the number of active gas storage fields in the United States and those which were operating at Delta Pressure. The total number of active fields at the time was 392; the total number of those active fields operating at Delta Pressure were 143. If the number of fields operating at Delta Pressure (143) is divided by the total number of active fields (392), the result is 36%.

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QUESTION 5.a.ii:

Please provide the data underlying this calculation and any related supporting documents in SoCalGas', Mr. Hower's and/or Mr.. [*sic*] Stinson's possession.

RESPONSE 5.a.ii:

Please see attached document I1906016_SCG_SED_DR_90_0000089.

QUESTION 5.a.iii:

On Line 4, Well Casing Design, cite the page and quote the words in EX I-6 that show the referenced 87%?

RESPONSE 5.a.iii:

SoCalGas objects to this request as unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure and on the ground it seeks information that is already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see SoCalGas Reply Testimony, Chapter I (Hower/Stinson), Ex. I-6, at p. 14 ("Appendices") ("Poll of U.S. Underground Natural Gas Storage Operators indicates that approximately 13% of existing gas storage wells have tubing and packer installed within the well bore – September 2016"). Tubing and packer completion is necessary for dual steel barrier. Therefore 87% of wells are operated with single barrier design.

QUESTION 5.a.iv:

Regarding the response to question 4.a.iii, do Messrs. Hower and Stinson assume that this report applies to ALL gas storage wells in the US, as stated on page 31, lines 10-11?

RESPONSE 5.a.iv:

SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent there is no "question 4.a.iii." SoCalGas assumes for the purposes of this response that SED intended to refer to question 5.a.iii. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The Report is based on a survey sent to operators for all 17,500 (approximate) on shore underground gas storage well in the U.S. and received an estimated 80% response rate, including 11,411 active storage wells. See Poll of U.S. Underground Natural Gas Storage Operators, p. 13.

QUESTION 5.a.v (1):

Regarding the response to question 4.a.iii, do Messrs. Hower and Stinson also assume that this report applies to:

ALL gas storage wells in the world?

RESPONSE 5.a.v (1):

SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent there is no "question 4.a.iii." SoCalGas assumes for the purposes of this response that SED intended to refer to question 5.a.iii. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

QUESTION 5.a.v (2):

Specific fields?

RESPONSE 5.a.v (2):

SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent it has no premise and, to the extent it intends to refer to question 4.a.iii, there is no "question 4.a.iii." SoCalGas assumes for the purposes of this response

that SED intended to refer to question 5.a.iii. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes, see response to 5.a.iv.

QUESTION 5.a.vi:

If the answer to question 5.a.v.2 is yes, please identify the underground storage fields to which it applies.

RESPONSE 5.a.vi:

SoCalGas objects to this request as unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Pursuant to SoCalGas Reply Testimony, Chapter I (Hower/Stinson), Ex. I-6, p. 14 ("Appendices"), there are an estimated 17,500 wells in the United States; the response rate for the poll described on this page was an estimated 80%, including 11,411 active storage wells. It does not specify individual fields.

QUESTION 5.a.vii:

Regarding the response to 4.a.iii, please explain in lay language why the source page referenced in footnote 22 of the testimony proves that 87% of all gas storage wells are single barrier.

RESPONSE 5.a.vii:

SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the phrase "lay language," and unintelligible to the extent there is no question 4.a.iii, and thus no "response to 4.a.iii." SoCalGas assumes for the purposes of this response that SED intended to refer to question 5.a.iii. SoCalGas further objects to this request to the extent that the information sought is equally available to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See response to 5.a.iii.

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QUESTION 5.a.viii:

On line 6 of the Table, "Maximum Age of Storage Wells", the entry says "Median age of repurposed wells is 7 years". What is the significance of noting in this table the industry age of wells as 7 years compared to the age of Aliso Canyon wells at 61 years?

RESPONSE 5.a.viii:

SoCalGas objects to this request on the ground that it is vague and ambiguous, particularly with respect to the term "significance." SoCalGas further objects to this request on the ground it is unintelligible to the extent it does not acknowledge SoCalGas' response to SED DR-61 Question 1, wherein SoCalGas noted "The original table in 3/20/2020 Expert Testimony indicated that the median age of repurposed wells is 7 years. This was a typo. The correct median age is 74 years." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. This was intended to note that the average age of wells at Aliso Canyon was *below* the median age of wells across the United States.

QUESTION 5.a.viii (b):

Regarding the response to question 4.a.vii, how does the data on line 6 relate to the table subject "Industry Standard Practice as of 10/23/2015"?

RESPONSE 5.a.viii (b):

SoCalGas objects to this request on the ground it is vague, ambiguous and unintelligible to the extent there is no "question 4.a.vii." Assuming this request intends to refer to "question 5.a.vii," SoCalGas further objects on the ground that this question remains vague, ambiguous and unintelligible.

QUESTION 6.a:

Regarding the table on page 5, line 8 with the entry, "Wellsite Inspections", please answer the following:

a. Is it Messrs. Hower and Stinson's contention that SoCalGas performed daily visits and monthly inspections of all of their Aliso Canyon Wells on and before October 23, 2015, as

shown in the last entry of that row under the column entitled "Practice At Aliso Canyon As Of 10/23/2015?

RESPONSE 6.a:

SoCalGas objects to this request on the ground it mischaracterizes or misunderstands Messrs. Hower and Stinson's testimony. SoCalGas further objects to the extent this requests asks a compound question. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. It is Messrs. Hower's and Stinson's contention that SoCalGas' policy and practice was to perform daily visits and monthly inspections of SoCalGas' Aliso Canyon gas storage wells.

QUESTION 6.b:

What evidence did Messrs. Hower and Stinson review that supports their claim in the last column that SoCalGas performed the daily visits and monthly inspections of Well SS-25, as identified in the box corresponding to the "Wellsite Inspections" row, and "Practice At Aliso Canyon As of 10/23/2015" column?

RESPONSE 6.b:

SoCalGas objects to this request to the extent it mischaracterizes or misunderstands Messrs. Hower and Stinson's testimony. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Messrs. Hower and Stinson relied on conversations with SoCalGas personnel regarding SoCalGas' policy and practice to perform daily visits and monthly inspections of SoCalGas' Aliso Canyon gas storage wells.

QUESTION 6.c:

Provide the evidence identified in response to question 6.b.

RESPONSE 6.c:

SoCalGas objects to this request on the grounds it is vague and ambiguous with respect to the phrase, "Provide the evidence." SoCalGas further objects to the extent that it assumes that any available evidence would exist in written or other tangible form. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A.

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QUESTION 7.a:

Regarding the Table on page 5, at Line 7, entitled "Well Integrity Monitoring", under the last column entitled "Practice At Aliso Canyon As Of 10/23/2015", which states "Integrity logs run during well reworks", please answer the following:

Is it Messrs. Hower and Stinson's belief that integrity logs were run during well reworks on SS-25?

RESPONSE 7.a:

SoCalGas objects to this request to the extent it is vague, ambiguous, and overly broad and unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, particularly to the extent it fails to specify a time frame to which SoCalGas may tailor its response. SoCalGas further objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson), p. 5. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to ask whether Messrs. Hower and Stinson understood that SS-25 was inspected under SoCalGas' Inspect and Replace Program, which began in 2007. No.

QUESTION 7.b:

If the answer to 7.a is Yes, how many times did this occur on SS-25?

RESPONSE 7.b:

SoCalGas objects to this request as vague and ambiguous with respect to the term "this." SoCalGas further objects to this request as overly broad and unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure to the extent it fails to specify a time frame to which SoCalGas may tailor its response. SoCalGas further objects to this request to the extent the information sought is equally available to SED. SoCalGas further objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson), p. 5. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. N/A.

QUESTION 7.c:

Provide the dates of all reworks on SS-25 reviewed by Messrs. Hower and Stinson prior to the date that their testimony was served.

RESPONSE 7.c:

SoCalGas objects to this request on the grounds it is argumentative, and vague and ambiguous with respect to the term "reviewed." SoCalGas further objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson), p. 5. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. N/A.

QUESTION 7.d:

Provide the bates numbers of pages in the SS-25 well file that support the answers to questions 7.a-c.

RESPONSE 7.d:

N/A.

QUESTION 8.a:

Regarding the Table on page 6 Line 12, with the title "Emergency Shutdown Valves", please refer to the entry in the third column entitled "Industry Standard Practice As Of 10/23/2015", Please specifically refer to the entry that states, "Only 11% ESD installed. Only 3% have SSSv"

a. Is it Messrs. Hower and Stinson's understanding that NO Aliso gas wells had SSSVs as of October 23, 2015?

RESPONSE 8.a:

SoCalGas objects to this request to the extent that it misinterprets SoCalGas' Reply Testimony, Chapter I (Hower/Stinson) at p. 6, line 12. SoCalGas further objects to this request to the extent that it is asking for information previously provided to SED. Finally,

SoCalGas objects to this request to the extent that it is unintelligible, in that the third column on page 6 of the above-mentioned testimony refers to "Industry Standards Practice as of 10/23/2015," whereas this question appears to ask about practice as Aliso Canyon, which is covered in the fourth column. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No.

QUESTION 8.b:

If the answer to 8.a is no, list which wells Messrs. Hower and Stinson understand had SSSvs as of October 23, 2015.

RESPONSE 8.b:

SoCalGas objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson) at p. 6, line 12. SoCalGas further objects to this request to the extent that it is asking for information previously provided to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request as asking about deep set SSSVs on operational wells, in which case the answer is N/A. As of October 23, 2015, there were six (6) shallow set SSSVs at Aliso Canyon (Frew 2, Standard Sesnon 10, Standard Sesnon 29, Standard Sesnon 3H, Standard Sesnon 9, Fernando Fee 33).

QUESTION 8.c:

Please define the term "ESD".

RESPONSE 8.c:

Emergency Shut Down.

QUESTION 8.d:

Do Messrs. Hower and Stinson believe the ESD on SS-25 was used on or about October 23, 2015?

RESPONSE 8.d:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "used." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. ESDs are automatic and activate in response to abnormal operating conditions at the wellhead. SoCalGas interprets the request as asking whether the ESD triggered closed on or about October 23, 2015. Yes.

QUESTION 8.e.:

For answer 8.d, explain why or why not.

RESPONSE 8.e:

See Response 8.d.

QUESTION 9.a:

Regarding page 7, footnote 29, the last sentence states in part: " . . . we use the term "industry standards" throughout this testimony to refer to the consistent practices we have observed first-hand through our work experiences." With this passage in mind, please answer the following:

a. Is it Messrs. Hower and Stinson's contention that they have first-hand knowledge of how all owners and operators of underground gas storage units manage their underground storage wells, reservoirs and related facilities?

RESPONSE 9.a:

SoCalGas objects to this request on the ground it is unintelligible and mischaracterizes and/or misunderstands the quoted testimony. SoCalGas further objects to this request on the ground that it is vague and ambiguous, particularly with respect to the phrases "all owners" and "related facilities" as well as the term "manage." SoCalGas additionally objects to this request to the extent it is argumentative to the extent that it implies that Messrs. Hower and Stinson purported to have first-hand knowledge of how "all owners and operators of underground gas storage units manage their underground storage wells,

reservoirs and related facilities." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No.

QUESTION 9.b:

Regarding the response to question 9.a. If the answer is No, provide detail regarding the scope of Howard's and Stinson's knowledge of underground storage units, specifying the companies and or gas storage fields that their knowledge is based on.

RESPONSE 9.b:

SoCalGas objects to this request on the ground it is overly broad and unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure. SoCalGas further objects to this request to the extent that it poses a compound question. SoCalGas further objects to this request on the ground that it is asking for information previously provided (in the quoted testimony) to SED. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see response to request 3 above and SoCalGas Reply Testimony, Chapter I (Hower/Stinson), pp. 2-3, 42-45. Additionally, Messrs. Hower and Stinson have visited 60 separate underground gas storage fields in the United States, over 19 separate states. These individual fields that Messrs. Hower and Stinson have worked at include:

State	Company Name	Field Name	Reservoir Name
CA	CENTRAL VALLEY GAS STORAGE LLC	PRINCETON GAS	PRINCETON GAS
CA	GILL RANCH STORAGE LLC	GILL RANCH	STARKEY
CA	LODI GAS STORAGE LLC	KIRBY HILLS	DOMENGINE
CA	LODI GAS STORAGE LLC	KIRBY HILLS	WAGENET
CA	LODI GAS STORAGE LLC	LODI	DOMENGINE
CA	LODI GAS STORAGE LLC	LODI	MIDLAND
CA	PACIFIC GAS AND ELECTRIC COMPANY	LOS MEDANOS	DOMENGINE
CA	PACIFIC GAS AND ELECTRIC COMPANY	MCDONALD ISLAND	MCDONALD
CA	PACIFIC GAS AND ELECTRIC COMPANY	PLEASANT CREEK	PETERS
CA	SOUTHERN CALIFORNIA GAS COMPANY	ALISO CANYON	SESNONFREW
CA	SOUTHERN CALIFORNIA GAS COMPANY	HONOR RANCHO	WAYSIDE 13

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CA	SOUTHERN CALIFORNIA GAS COMPANY	LA GOLETA	VAQUEROS
CA	SOUTHERN CALIFORNIA GAS COMPANY	PLAYA DEL REY	PUENTE
CA	WILD GOOSE STORAGE INC	WILD GOOSE	L4
CO	COLORADO INTERSTATE GAS COMPANY	FLANK	MORROW AND CHER
CO	COLORADO INTERSTATE GAS COMPANY	FORT MORGAN	DAKOTA D
CO	COLORADO INTERSTATE GAS COMPANY	LATIGO	DAKOTA J
CO	COLORADO INTERSTATE GAS COMPANY	TOTEM STORAGE	J SAND
CO	COLORADO INTERSTATE GAS COMPANY	YOUNG	DAKOTA D SAND
CO	PUBLIC SERVICE COMPANY OF COLORADO	ROUNDUP	JSAND
IA	NATURAL GAS PIPELINE CO OF AMERICA	CAIRO	GALESVILLE MT
IA	NORTHERN NATURAL GAS COMPANY	REDFIELD	ST PETER ELGIN
IL	AMEREN ILLINOIS	HILLSBORO	ST PETER
IL	NATURAL GAS PIPELINE CO OF AMERICA	LOUDON	DEVONIAN
IL	NORTHERN ILLINOIS GAS COMPANY	ANCONA	MT SIMON
IL	NORTHERN ILLINOIS GAS COMPANY	HUDSON	MT SIMON
IL	NORTHERN ILLINOIS GAS COMPANY	LAKE BLOOMINGTO	MT SIMON
IL	NORTHERN ILLINOIS GAS COMPANY	LEXINGTON	MT SIMON
IL	NORTHERN ILLINOIS GAS COMPANY	PONTIAC	GALESVILLE
IL	NORTHERN ILLINOIS GAS COMPANY	PONTIAC	MT SIMON
IL	NORTHERN ILLINOIS GAS COMPANY	TROY GROVE	MT SIMON
IL	PEOPLES GAS LIGHT AND COKE COMPANY	MANLOVE FIELD (	
IN	INDIANA GAS COMPANY DBA VECTREN	UNIONVILLE	DEVONIAN
KY	ATMOS ENERGY CORPORATION	EAST DIAMOND	BETHEL SANDSTON
LA	BOBCAT GAS STORAGE	PORT BARRE SALT	PORT BARRE SALT
MD	TEXAS EASTERN TRANSMISSION LP	ACCIDENT	ORISKANY
MO	LACLEDE GAS COMPANY	FLORISSANT	ST PETER SANDS
MS	PETAL GAS STORAGE LLC	PETAL	PETAL SALT DOME
NM	El Paso Nat Gas	San Ysidro	
NM	EL PASO NATURAL GAS COMPANY	WASHINGTON RANC	MORROW
OH	COLUMBIA GAS TRANSMISSION LLC	WEAVER	CLINTON

OR	NW NATURAL	MIST	ALS POOL
OR	NW NATURAL	MIST	BRUER
OR	NW NATURAL	MIST	BUSCH
OR	NW NATURAL	MIST	FLORA
OR	NW NATURAL	MIST	MEYER
OR	NW NATURAL	MIST	REICHHOLD
OR	NW NATURAL	MIST	SCHLICKER
PA	DOMINION TRANSMISSION INC	OAKFORD	MURRYSVILLE
PA	NATIONAL FUEL GAS SUPPLY CORPORATION	WHARTON STORAGE	ORISKANY
TX	ATMOS PIPELINE TEXAS	BETHEL	LOUANNE SALT
TX	ENSTOR KATY STORAGE TRANSPLP	KATY HUB & STOR	FULSHEAR HILLE
TX	KINDERMORGAN TEXAS PIPELINE LP	DAYTON NORTH	LOUANN SALT
TX	Nortex	Worsham Steed	
UT	QUESTAR PIPELINE COMPANY	CLAY BASIN	DAKOTA
WA	PUGET SOUND ENERGY	JACKSON PRAIRIE	ZONES 2 9
WV	HARDY STORAGE COMPANY LLC	HARDY	ORISKANY
WY	CLEAR CREEK STORAGE COMPANY LLC	CLEAR CREEK	NUGGET
WY	CLEAR CREEK STORAGE COMPANY LLC	CLEAR CREEK	NUGGET
WY	WILLISTON BASIN INTERSTATE PIPELINE	ELK BASIN	CLOVERLY

QUESTION 9.c:

Regarding the response to question 9.b. If the answer is Yes, provide all of the documentation that Howard and Stinson rely on to make this claim.

RESPONSE 9.c:

SoCalGas objects to this request as vague, ambiguous and unintelligible in that question 9.b. does not call for a "yes" or "no" response. SoCalGas further objects to this request on the ground it is overly broad and unduly burdensome pursuant to Rule 10.1 of the

Commission's Rules of Practice and Procedure, particularly to the extent that it seeks information provided to SED both in response to various data request as well as the exhibits provided in SoCalGas' Reply Testimony, Chapter I (Hower/Stinson). Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See all exhibits to SoCalGas Reply Testimony, Chapter I (Hower/Stinson). See also, e.g., all state regulations reviewed by Messrs. Hower and Stinson attached (I1906016_SCG_SED_DR_90_0000093 – 0006698).

QUESTION 10.a:

Regarding page 8, the portion of lines 12-13 that states, "SoCalGas met or exceeded gas storage industry and industry standard practices regarding well failures and subsequent investigations into their causes.", [*sic*] please answer the following:

a. In this passage, explain the difference between "gas storage industry" and "industry standard practices."

RESPONSE 10.a:

SoCalGas objects to this request on the ground it is unduly burdensome to the extent it seeks information already in the possession of SED, as acknowledged in Question 10.b below. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The above-quoted testimony should say "SoCalGas met or exceeded *gas storage industry standard practices* regarding well failures and subsequent investigations into their causes."

QUESTION 10.b:

Please acknowledge that the "gas storage industry and industry standard practices" mentioned in this sentence are those identified in the last sentence of Footnote 29.

RESPONSE 10.b:

SoCalGas objects to this request on the ground it is unduly burdensome to the extent it seeks information already in the possession of SED, as acknowledged in the question itself. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

Pursuant to both footnote 15 as well as footnote 29 in SoCalGas' Reply Testimony, Chapter I (Hower/Stinson), "gas storage industry standard practices" refers to prevailing practice within the gas storage industry based on the practices that Messrs. Hower and Stinson have knowledge of through their work experience as well as any additional information gathered by Messrs. Hower and Stinson in their review of gas storage industry standard practices as explained in response to request 4.c above.

QUESTION 10.c:

Please identify with reference to well fields and well numbers or names all of the first-hand experiences Messrs. Hower and Stinson have regarding well failures and subsequent investigations into their causes.

RESPONSE 10.c:

SoCalGas objects to this request as vague and ambiguous with respect to the phrases "well numbers" and "first-hand experiences." SoCalGas further objects to this request as overly broad and unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure. SoCalGas further objects to this request to the extent that it compound. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See above response to request 9.b. Messrs. Hower and Stinson's work at many of the fields that they have worked at has included the review of well failures.

QUESTION 10.d:

If the answer to 10.b is a refusal to acknowledge, then please define what is meant by "gas storage industry and industry standard practices".

RESPONSE 10.d:

SoCalGas objects to this request on the ground it is vague, ambiguous and unintelligible, particularly with respect to the phrase, "a refusal to acknowledge." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. N/A.

QUESTION 10.e:

Please provide the basis for the definition provided in response to question 10d.

RESPONSE 10.e:

SoCalGas objects to this request on the ground it is vague and ambiguous, particularly with respect to the phrase, "provide the basis." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A.

QUESTION 11.a:

For this next set of questions, please refer to the following passages:

First, refer to the portion of page 8, Line 15 through page 9 Line 1 that states, "Moreover, SED and Blade mischaracterize the 60 or 63 well casing issues of varying cause and degree as 'leaks'. (Footnote omitted.) Indeed, the number of actual casing leaks is less than half that number, and only two of those (FF-34A and Frew 3) were of the scale where gas migrated some distance in the subsurface away from the wellbore."

Second, refer to page 12, lines 4 through 5, heading B that states, "Many of the Casing 'Leaks" Identified by SED Were Insignificant and Are Irrelevant to What Occurred at SS 25" (Emphasis in original.) With both passages in mind, please answer the following:

a. Is it Messrs. Hower and Stinson's contention that if a well leaks, but the gas does not migrate some distance in the subsurface away from the wellbore, that leaks are insignificant and do not need to be investigated or repaired?

RESPONSE 11.a:

SoCalGas objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson). SoCalGas further objects to this request on the grounds that it is argumentative in implying that Messrs. Hower and Stinson believe that gas leaks, where "gas does not migrate some distance in the subsurface away from the wellbore," do not need to be investigated or remediated. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

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QUESTION 11.b:

Do Messrs. Hower and Stinson dispute that there were 63 well casing leaks, as identified by Blade's Root Cause Analysis, page 2?

RESPONSE 11.b:

SoCalGas objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson). SoCalGas further objects to this request on the ground it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Yes.

QUESTION 11.c:

Do Messrs. Hower and Stinson assert that "the number of actual casing leaks is less than half of that number (63)" based on the assertion that "Many of the Casing 'Leaks' Identified by SED Were Insignificant and Are Irrelevant to What Occurred at SS 25"?

RESPONSE 11.c:

SoCalGas objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter (Hower/Stinson). SoCalGas further objects to this request on the grounds it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see SoCalGas' Reply Testimony, Chapter I (Hower/Stinson), pp. 12-16, and SoCalGas response to SED 65, Question 2.

QUESTION 11.d:

If the answer to question 11c is no, please explain why Messrs. Hower and Stinson do not accept all 63 well casing leaks identified on page 2 of Blade's Root Cause Analysis as valid, but instead assert that less than half of those leaks existed.

RESPONSE 11.d:

SoCalGas objects to this request to the extent that it mischaracterizes SoCalGas' Reply Testimony, Chapter I (Hower/Stinson). SoCalGas further objects to this request on the ground it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 11.c.

QUESTION 12.a:

Regarding the portion of page 9 Lines 15-16 that states, "As of the date of the incident there was no documented industry standard related to investigation of casing failures in gas storage operations.", [*sic*] please answer the following:

a. Please confirm that the 'industry standard" in this sentence is defined by the last sentence in footnote 29.

RESPONSE 12.a:

SoCalGas objects to this request on the ground it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to response to request 10.b herein.

QUESTION 12.b:

When Messrs. Hower and Stinson refer to "no documented industry standard," are they referring to the absence of such documents in their personal libraries?

RESPONSE 12.b:

SoCalGas objects to this request on the ground it is argumentative. SoCalGas further objects to this request as vague and ambiguous, particularly with respect to the phrase

"personal libraries." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No.

QUESTION 12.c:

If the answer to 11.b. is NO, please describe the scope of information underlying this statement.

RESPONSE 12.c:

SoCalGas objects to this request on the ground it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A

QUESTION 13.a:

Please refer to page 24, lines 13 through 15, which state in part, "Of the 31 U.S. states with gas storage operations in October 2015, only six states had added requirements that production casings on existing, retrofitted wells be cemented to surface."

a. Please list the six states mentioned in this passage.

RESPONSE 13.a:

The above quoted statement from Messrs. Hower's and Stinson's testimony requires a correction. This sentence should read "Of the 31 U.S. states with gas storage operations in October 2015, only six states had added requirements that production casings be cemented to surface." There are no specific regulations requiring cementing for "existing" or "retrofitted" wells in any of those six states (or any other states with regards to cement-to-surface). The six states referenced are Alaska, Illinois, Michigan, Missouri, Texas, and West Virginia. Alaska, Michigan and Texas require cementing to surface for new storage well permits as a matter of practice but it is not addressed in regulations; this is based on conversations with regulators in those states.

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QUESTION 14.a:

Please refer to page 26 line 21 through page 27 line 1, which states, "Similarly, within the areal 'footprint' of a cathodic protection system, all wells must be protected. The Aliso Canyon field is not only a gas storage field, but there are non-storage operations within the field boundaries accessing shallower hydrocarbon production. These shallow wells are not operated by SoCalGas." With this passage in mind, please answer:

a. Provide a map of Aliso Gas Storage area showing the locations of shallow wells that are not operated by SoCalGas. (It is not necessary to identify the owner or operator of these wells.)

RESPONSE 14.a:

SoCalGas objects to this request on the ground it is overly broad and unduly burdensome and seeks information that is outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see attached document: I1906016_SCG_SED_DR_90_0000090.

QUESTION 15.a:

Please refer to page 28, line 21 through page 29 line 3, which states, "Moreover, the 'Replace and Inspect' initiative included detailed evaluations of the wellbore integrity and replacement of well hardware equipment, such as wellhead valves and the well tubing and packer. As a result of this initiative, SoCalGas permanently removed six wells, of approximately 30 wells inspected, from service based on their downhole condition." With this passage in mind, please answer the following:

a. Provide a list of the six wells that SoCalGas permanently removed.

RESPONSE 15.a:

SoCalGas objects to this request on the ground it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The following wells were permanently removed:

Fernando Fee-32E
Frew-3
Frew-9
Mission Adrian-5A
Standard Sesnon-7
Standard Sesnon-8

QUESTION 15.b:

Provide a list of the approximately 30 wells that were inspected.

RESPONSE 15.b:

SoCalGas objects to this request on the ground it is unduly burdensome to the extent it requests information that is already in SED's possession. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The list of wells that were inspected during this period is as follows:

Fernando Fee-32A
Fernando Fee-32C
Fernando Fee-32D
Fernando Fee-32E
Fernando Fee-32F
Fernando Fee-32G
Fernando Fee-32H
Fernando Fee-34BR
Frew-3
Frew-9
Mission Adrian-5A
Porter-26C
Porter-26E
Porter-32B
Porter-32D
Porter-37
Porter-42B
Porter-50A

Porter-50B
Porter-50C
Porter-69B
Porter-69D
Porter-69E
Standard Sesnon-10
Standard Sesnon-44A
Standard Sesnon-4B
Standard Sesnon-6
Standard Sesnon-7
Standard Sesnon-8
Standard Sesnon-9

QUESTION 15.c:

Of the 30 wells that were inspected, provide well files for any wells on the list provided in response to 15.b. that SoCalGas has not already provided to SED as part of this proceeding.

RESPONSE 15.c:

SoCalGas objects to this request as overly broad and unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The wells inspected, but for which well files have not previously been requested or provided to SED, are:

Fernando Fee-32G
Fernando Fee-32H
Fernando Fee-34BR
Porter-32D
Porter-50B
Porter-50C
Porter-69B
Porter-69D
Porter-69E

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-90 DATED MAY 12, 2020)

SOCALGAS RESPONSE DATED MAY 29, 2020

The well files for these wells have been provided in the attached at I1906016_SCG_SED_DR_90_0006699 – 1906016_SCG_SED_DR_90_0029128.

Response to Data Request

Response to SED Data Request-69

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 69 related to casing leaks from Reply Testimony of Mr. Tim Hower and Mr. Charlie Stinson on behalf of SoCalGas.

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Date:
Jun. 9, 2020

Version:
1

Project Number:
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Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
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Version History

Version	Date	Description of Change

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1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on April 8, 2020. Data Request No: SED 69 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED DR 69 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The questions are related to the document titled: *Chapter I, Prepared Reply Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on behalf of Southern California Gas Company (U 904 G)* (file name: "1_Ch. I - MHA - Hower and Stinson (A Final).pdf").

2 Questions and Responses

2.1 Question 1

1. On page 8, it states, "Moreover, SED and Blade mischaracterize the 60 or 63 well casing issues of varying cause and degree as "leaks". [Footnote omitted] Indeed, the number of actual casing leaks is less than half that number, and only two of those (FF-34A and Frew 3) were of the scale where gas migrated some distance in the subsurface away from the wellbore". [Footnote omitted.]. See the supporting explanations that follow this passage to page 16, where it states,

   "There were 31 casing "leaks" documented by Blade which were not leaks at all, were double or triple counted leaks from the same event, or did not occur during the conversion of the field to underground gas storage, initial drilling of a new storage well, routine casing repairs of stage collars, and a water shut-off test. Further, only two of the actual casing leaks documented by Blade (FF-34A and Frew 3) involved situations where gas was known to have mitigated some distance in the subsurface away from the wellbore." [Footnote omitted.]

   With this section in mind, please answer.

2.1.1 Questions and Blade Responses

a. Does Blade disagree with any part of this statement?

   Yes.

   Furthermore, the second line of the quote includes the words ". . . did not occur . . ." which is not consistent with the text in the *Chapter I, Prepared Reply Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on behalf of Southern California Gas Company* [1, pp. 12-13]. Blade believes the sentence is mis-stated in the Testimony of Tim Hower and Charlie Stinson. Blade's reply to this data request assumes it is a misstatement. To be consistent with the text in the original document, perhaps the sentence should read as follows (shown with simulated track changes).

   "There were 31 casing "leaks" documented by Blade which were not leaks at all, were double or triple counted leaks from the same event, or ~~did not occur~~ occurred during the conversion of the field to underground gas storage, initial drilling of a new storage well, routine casing repairs of stage collars, and a water shut-off test."

   Blade's response assumes the words "did not occur" should be replaced with "occurred".

b. If so, with which parts does Blade disagree?

   "There were 31 casing "leaks" documented by Blade which were not leaks at all, were double or triple counted leaks from the same event, or ~~did not occur~~ occurred during the conversion of the field to underground gas storage, initial drilling of a new storage well, routine casing repairs of stage collars, and a water shut-off test."

c. For each part of the statement with which Blade disagrees, please explain why.

   The Blade Main Report *Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon SS-25* [2, pp. 162-163] stated 63 instances of casing leaks in the 124 Aliso Canyon field wells were evaluated. As Blade was in the process of conducting the RCA, it was important to

determine if there were wells in the Aliso Canyon field that had experienced failures under conditions similar to SS-25 and to get a sense of the general condition of the wells, in particular, the condition of the production casing. The production casing of a gas storage well is a pressure vessel designed to contain gas at the field operating pressure. In addition to casing leaks and parted casing, another indication of the condition of the production casing was the identification of 29 tight spots in the production casing of Aliso Canyon wells. Tight spots are not a normal condition for casing; they indicate the casing has deteriorated after the initial installation. Typically, the mitigation for casing tight spots is to ream and mill the casing tight spot back to an internal diameter (ID) that allows running service tools and completion equipment as required to put the well back in service. The process of reaming and milling removes metal and reduces the wall thickness of the casing and can result in future casing leaks. This assertion of casing leaks caused by milling tight spots is supported by a SoCalGas document discussing milling and a casing leak in P-44 [3] (AC_BLD_0113490).

The condition of production casing can be evaluated in several ways. Blade chose to take a broad view and evaluate the production casing failures in the Aliso Canyon field that were designated as gas storage wells or gas storage/oil and gas wells by DOGGR as of May 2018. This date was when the list of 124 wells was compiled. The spud dates for the wells ranged from 1939 to 2015. Some of the wells including SS-25 were originally drilled as oil and gas wells and converted to gas storage in the early 1970s.

A production casing or liner failure was defined in the Blade supplementary report *Analysis of Aliso Canyon Wells with Casing Failures* [4, p. 5] as ". . . a condition or defect where a casing fails to perform in the manner they were designed for." Casing failures were categorized by Blade in broad categories as: leaks, tight spots, parted casing, or other.

Part of the challenge when reviewing historical well files to determine the condition of wells is dealing with errors, inconsistencies, transposition of numbers, and typos in the daily reports which requires the reviewer to "read between the lines" in an attempt to understand the events and operations described in well files. This can result in different *interpretations* of the events described in the daily reports.

An example of inconsistencies in daily reports was found in the SS-25A well file [5, p. 18]. Figure 1 (AC_CPUC_0000766) shows the bottom of the casing patch at 3,110 ft. Other documents show the bottom of the patch at 3,010 ft (Figure 2, page 14, AC_CPUC_0000762 and Figure 3, page 15, AC_CPUC_0000763). The depth of 3,010 ft was likely to be correct because the typical length of a casing patch was 40 ft, based on reviews of other well records.

9/8/2010	Filled well with 4 bbls. Pulled out of well with kill string and laid down wash pipe. Made up WEA casing patch and ran to 2119'. Worked thru tight spot and ran to 2157'. Worked thru tight spot and ran to 2970' (top) and bottom at 3110'. Rigged up and set patch with pump at 4000 psi. Pulled thru with rig at 60,000#.

Figure 1: SS-25A Daily Report

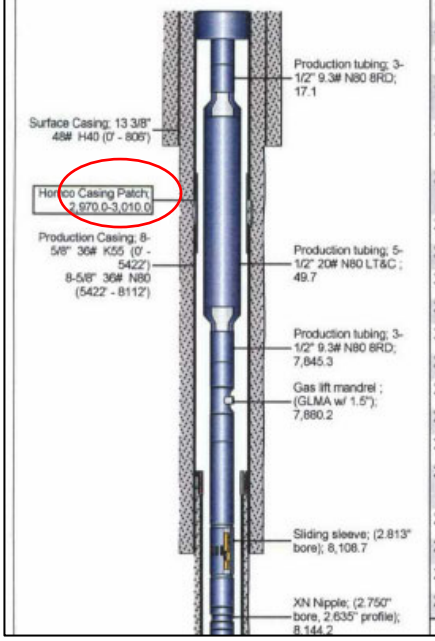
Standard Sesnon 25 A

Tubing Detail

Operator	Field Name	API	Well Type	Orig KB Elev (ft)	KB-Grd (ft)	TD (max) (ftKB)
Southern California Gas Company	Aliso Canyon	03721322	Gas Storage	2,942.00	15.00	8,917.0

Main Hole, 11/29/2010 2:19:43 PM

Vertical schematic (actual)



Production tubing set at 8,215.0ftKB on 8/10/2010 11:23

Item #	Jts	Item Des	OD (in)	ID (in)	Wt (lb/ft)	Grade	Len (ft)	Top (ftKB)	Btm (ftKB)
2-1		Tubing hanger	7.825	2.867			0.46	15.0	15.5
2-2		Pup joint	3 1/2	2.867	9.30	N80	1.58	15.5	17.1
2-3	1	Production tubing	3 1/2	2.867	9.30	N80	31.10	17.1	48.2
2-4		Cross over (3-1/2" x 5-1/2")	5 1/2	2.867			1.58	48.2	49.7
2-5	202	Production tubing	5 1/2	4.653	20.00	N80	7,794.33	49.7	7,844.1
2-6		Cross over (5-1/2" x 3-1/2")	5 1/2	2.867			1.26	7,844.1	7,845.3
2-7	1	Production tubing	3 1/2	2.867	9.30	N80	31.18	7,845.3	7,876.5
2-8		Pup joint	3 1/2	2.867			3.70	7,876.5	7,880.2
2-9		Gas lift mandrel	3 1/2	2.867			6.12	7,880.2	7,886.3
2-10		Pup joint	3 1/2	2.867			4.20	7,886.3	7,890.5
2-11	7	Production tubing	3 1/2	2.867	9.30	N80	218.21	7,890.5	8,108.7
2-12		Sliding sleeve	3 1/2	2.813			4.25	8,108.7	8,113.0
2-13	1	Production tubing	3 1/2	2.867	9.30	N80	31.18	8,113.0	8,144.2
2-14		XN Nipple	3 1/2	2.635			1.40	8,144.2	8,145.6
2-15	1	Production tubing	3 1/2	2.867	9.30	N80	31.22	8,145.6	8,176.8
2-16		Cross over (3-1/2" x 2-7/8")	3 1/2	2.441			1.10	8,176.8	8,177.9
2-17		COE	3 1/2	2.365			2.65	8,177.9	8,180.5
2-18		HES G77 packer	5 1/2	2.365			3.39	8,180.5	8,183.9
2-19		Ball catcher seat	2 7/8	2.441			0.38	8,183.9	8,184.3
2-20	1	Production tubing	2 7/8	2.441		N80	30.69	8,184.3	8,215.0

Figure 2: SS-25A Tubing Detail

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HALLIBURTON COMPLETION SERVICES

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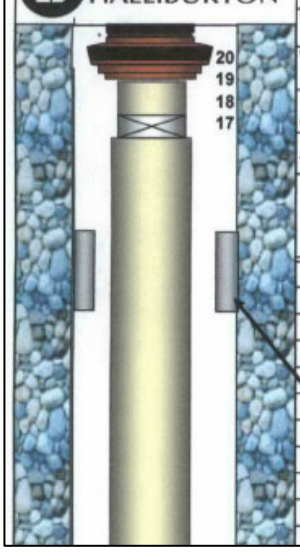


Company: SO CAL GAS CO.			Co. Representative: MIKE VOLKMAR // RON CARLSON			DATE: 10/27/2010
Well Name: SS 25 A			Field Name: ALISO CANYON	County: LOS ANGELES		STATE: CA
Casing	Size: 6 5/8"	Weight: 28#	Depth: C.O.E. 8180.59	Stage: 1	TOL: 7,926	FLUID WT.: N/A
Tubing	Size: 5 1/2"	Weight: 20#	Thread: A-B FL4S; BHA Length: 370.93	Fluid Level in Tubing: FULL		FLUID TYPE: N/A
Perforations: to			Gun Size; SPF; Charge Type	BHP: NA	BHT	DEVIATION
			Phasing; Explosve Type		Charge Case	

Item	Description	OD	ID	Length	Depth
	NOTE: Up wt 158k Down wt 134K.				
	Packer set with 12k compression. Ball Catcher sub sheared				
	at 2450 psi.				
	HOMCO CASING PATCH 2970-3010				

Figure 3: SS-25A Completion Report

Another example of inconsistencies is from the P-42B well file [6, pp. 74-75]. The report for September 23, 2014, shows the bridge plug was set at 7,519 ft (Figure 4). The report on September 24, 2014, shows the bridge plug at 7,510 ft (Figure 4). In some cases, the discrepancies may not matter, but it causes the reviewer to make judgements regarding accurate details and information.

9/23/2014	The well required 43 bbl of 8 5 ppg KCl brine to fill Pulled out of the well and laid down the milling assembly Made up a 5" WEA retrievable bridge plug on the 2-7/8" workstring Ran in the well to 7519', set the 5" bridge plug, and filled the well with 10 bbl of KCl brine Pressure tested the 2-7/8" x casing annulus to 500 psig (bled down 200 psig in 3 minutes) Bled down and dumped 1 cuft of sand Pulled out of the well to a kill string at 3000' and secured the well
9/24/2014	Rig down for 3 hours for repairs Filled the well with 41 bbl of KCl brine. Pulled out of the well with a kill string and laid down the bridge plug retrieving tool Made up a WEA 5" test packer on the 2-7/8" workstring Ran in the well to 7481', filled the well with 10 bbl of KCl brine, set the test packer, pressure tested from 7418' to the bridge plug at 7510' to 500 psig for 10 minutes (test good) Released the test packer and pulled to 7418', set the test packer and pressure tested from 7418' to 7510' to 500 psig (No test, bleed to 0 psig) Rigged up and pressure tested the 2-7/8" x casing annulus to 500 psig for 20 minutes (test good) Released the test packer, pulled to 7100' and secured the well

Figure 4: P-42B Daily Report

Depending on how the rig operations are described in the daily reports, it can be a challenge to interpret daily reports related to pressure testing casing. Sometimes it is not clear if the pressure is applied down the tubing or down the casing with a test packer set in the well. The test pressure could be applied to the casing to test the casing above the packer or to the tubing to test the casing below the packer. Figure 5 is a pressure testing and leak location example from the MA-5A well file [7, p. 37] that is not clear. For example, the report in Figure 5 shows "*1580' pressure tested csg @ 1000 psi - held OK*". It is not clear if the test pressure was applied above 1,580 ft or below 1,580 ft. It is left up to the reviewer to assume the casing held pressure from 1,580 ft to surface, because the assumed packer setting depths deeper that 1,580 ft seem to indicate the pressure test did not hold and fluid was pumped in a leak at the rates in BPM (barrels per minute) indicated.

Start Date	Ops. DOGGR Rpt
11/18/2004	Checked well for H2S, CO and LEL. 0 psi on tbg, csg and surface pipe. POOH and stood back DCs. PU 7" test pkr and RIH to test the 7" csg at the following depths (see below). POOH and LD test pkr. PU 6" drill bit and four 4 3/4" DCs and RIH and tagged @ 2025'. RU Power swivel and continued drilling out cmt until the tbg plugged off @ 2100'. POOH w/ BHA. Closed in well and secured rig. 1847', 0.8 BPM @ 1000 psi, 1817', 0.8 BPM @ 1000 psi, 1786', 0.8 BPM @ 1000 psi, 1755', 1.0 BPM @ 1000 psi, 1728', 1.0 BPM @ 1000 psi and 4.0 BPM @ 700 psi on csg, 1580' pressure tested csg @ 1000 psi - held OK, 1688', tbg @ 950 psi @ 1.4 BPM, 300 psi @ 4.8 BPM on csg, 1658', csg 700 psi @ 5 BPM - communication w/ tbg, 1628', csg @ 950 psi @ 0.5 BPM w/ full communication.

RECEIVED SEP 23 2005

Figure 5: MA-5A Daily Report

The 31 casing leaks challenged in Question 1 are not specifically listed in one place in the Hower and Stinson document [1, pp. 13-15]. However, they can be inferred from the discussion in the document. Blade addresses the 31 leaks in the following discussion. The groups of wells where the 31 casing leaks are being challenged will be discussed separately. The text from Hower and Stinson document is included in bold font for reference.

Eleven casing leaks (Wells P-12, SS-14, SS-17, P-47, P-25R 4x, FF-35E 2x and SF-2) identified by Blade were actually discovered in wells before SoCalGas operated the field or during initial conversion of

the field to underground gas storage. One of these leaks (SS-17) happened in 1952 and occurred during the original drilling of an oil and gas production well by SoCalGas' predecessor. This leak occurred 20 years before the conversion of the field to gas storage and cannot be attributed to SoCalGas storage operations and need not have been investigated by SoCalGas. The other ten leaks that were identified during the conversion to underground gas storage. SoCalGas' identification and remediation of these casing failures simply validates the process that SoCalGas used to inspect and repair, if necessary, all wells prior to putting them into service for gas storage. This is exactly how a conversion process should be performed in a depleted oil or gas field.

Blade Response:

As discussed in the previous response, Blade evaluated 124 wells that were designated as gas storage wells or mixed usage gas storage/oil and gas wells. If any of these wells exhibited a leak at any time in its life, it was included in Blade's study. Blade agrees that eleven casing leaks were identified between 1952 and 1979. A review of the casing and liners that leaked reveals the condition of the casing in the wells that were converted to gas storage. As discussed in the Blade Main Report [2, p. 164] and supplementary report [4, p. 5], it was not possible to determine if the casing leaks occurred in the pipe body or in a connection in many failures based on SoCalGas well records. Also as pointed out in the Blade supplementary report [4, pp. 32-36], most of the casing and liner connections in the Aliso Canyon wells are API connections and pre-1980s vintage reduced OD proprietary connections that are prone to structural failures and internal and external leaks.

A case can be made that wells with these types of connections were not suitable for gas storage service, especially if gas is to be injected down the casing without a secondary barrier to contain the gas in the event of primary barrier failure. Guidelines and standards outside the gas storage industry would define a well with injection down the production × tubing annulus as a multipurpose well that requires two well barriers to prevent release of the annulus media [8, p. 65], i.e., intermediate casing capable of withstanding a leaking production casing scenario.

Casing and liner connections in the wells discussed in the Blade reports included flush joint (which is inherently weak), Speedtite (the same connection used in SS-25 that leaked in the lab tests), buttress thread casing (BTC), long thread casing (LTC), and T&C (threaded and coupled) which are API connections and are not recommended for gas service. Leaking and parted Speedtite connections were discussed in a SoCalGas Interoffice Correspondence in 1977 as stated in the Blade supplementary report [4, p. 33]. A relevant paragraph from that report follows:

> Problems with 7 in. Speedtite connections were discussed in a SoCalGas interoffice correspondence document [9] dated November 25, 1977. A temperature survey run in SS-5 on September 28, 1977, showed several 8°F cooling anomalies at 150 ft, 300 ft, and 1,300 ft with smaller anomalies in between. The cooling suggested that the connections leaked and the pressure bled off after the bottom-hole safety valve was closed as discussed in the Interoffice Correspondence. The problems with Speedtite connections were in reference to a parted Speedtite connection in SS-12 and the subsequent parting of two additional connections during the workover while pressure testing. The cooling anomalies observed indicate that the Speedtite connection leaked when the reported casing pressure was 2,930 psi.

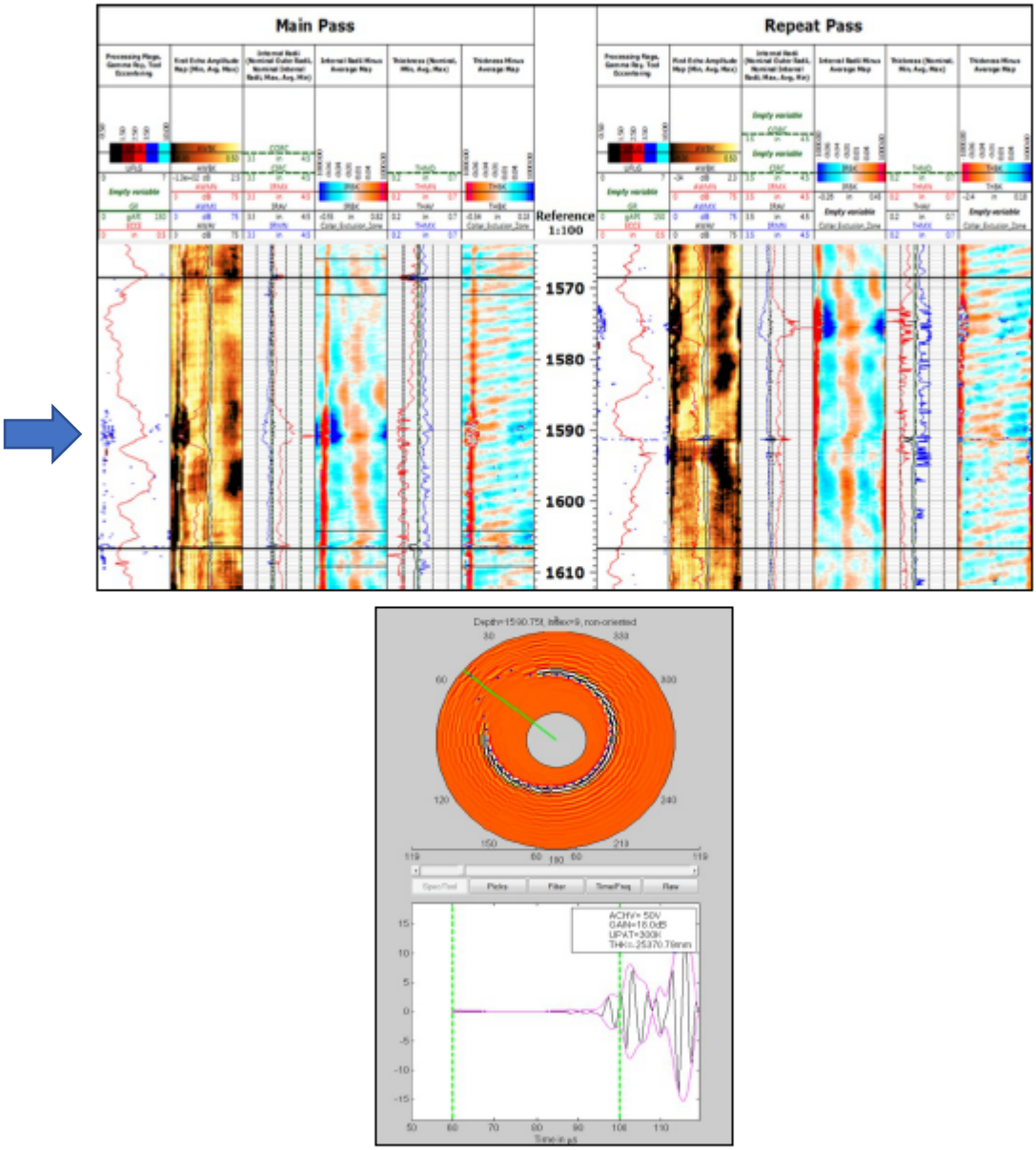
One leak occurred in 1979 (Well MA-1B) during initial drilling and completion operations for new storage wells. This leak, occurring during a pressurization test with nitrogen during drilling, had nothing to do with underground storage operations and was rectified prior to the well ever being put into service for gas storage. Moreover, this leak was much deeper than the leak at SS-25.

Blade Response:

The well records Blade reviewed did not show the MA-1B leak was pressurized with nitrogen. Nevertheless, a leak in the 8 5/8 in. BTC casing was identified between 1,597 and 1,605 ft while drilling and was repaired by squeeze cementing. A casing patch was run during the completion in 1980. The casing patch was replaced in 1981 and 1982. A 6 5/8 in. inner casing was run in 1983. A USIT log casing evaluation in 2017 [10, p. 3] (AC_BLD_0067599) included a comment that the anomaly in joint 39 between 1,570 and 1,610 ft is possibly because of split casing (Figure 6). An inner casing was run and cemented in the well in 2017. Blade's position is that the 8 5/8 in. production casing is a pressure vessel and these historic leaks are relevant in the wells' ability to contain the maximum well pressure.

Schlumberger Southern California Gas Company Mission Adrian 1B Casing Integrity Evaluation

Figure below shows the snapshot of depth interval 1570-1610 ft of Joint no [39]. Both main and repeat passes indicate loss of echo in this interval, it can be seen as brown flags on processing flag map (UFLG). The first echo amplitude map (AWBK) also shows a distinct dark band on the log. The cross-section plots clearly show loss of casing echo at these depths. These behaviors suggest that the anomaly is possible due to casing split.



5 Schlumberger 3 MA-1B USIT AC_BLD_0067595.pdf 5/19/2017

AC_BLD_0067599

Figure 6: MA-1B Casing Integrity Evaluation

Seven of the casing leaks (Wells FF-32F, SS-25A, FF-32E, P-26B, SS-25B, FF-35B, and SS-44A) identified by Blade and forming the basis of seven SED violations were actually leaking stage collars. Stage collars are devices used for multi-stage cementing of production casing in wells. The stage collar is essentially a sliding valve in the casing that can be opened to allow cement to be pumped outside of the casing into the annulus between the production casing and the wellbore. It is quite common for stage collars to not seal completely upon closing the sliding valve after the cementing procedure. This situation is easily remedied with a simple casing repair. More importantly, these stage collar leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well, and no follow-up investigation or failure analysis is required to determine the obvious root cause of these particular casing leaks, which are common across the entire gas industry.

Blade Response:

Blade takes the position that the production casing in a gas storage well is a pressure vessel and anything that compromises the pressure integrity of the production casing requires taking the well out of service until the leak has been properly repaired. Because the stage collar is a component of the production casing, pressure integrity of the stage collar is essential especially considering single barrier casing injection and production.

A stage collar has elastomeric seals that can result in leaks but there could be other causes of stage collar leaks. This raises the question of using stage collars in gas storage well production casing when the elastomer seals may hold initially but can deteriorate with time and temperature and eventually leak with no good way to reliably repair the leak.

The SoCalGas casing leak list [11] (AC_BLD_0075728 – AC_BLD_0075729) included stage collar leaks that were listed as leaks in the same well multiple times. The SoCalGas procedure to repair stage collar leaks included squeeze cementing, inner string installation, and expandable casing patches. When the casing patch leaked, it was recovered and a new casing patch was run in an attempt to re-patch the leak.

Casing patch experiences for the two wells on the same wellsite as SS-25 are presented as examples of wells with stage collar leaks and attempts to repair the leaks.

- Well SS-25A was drilled in 1972. According to the well records a casing patch was installed across the stage collar in 1981. The casing patch was removed in 2010 and a USIT log was run. The casing was pressure tested to 1,600 psi and bled to zero in 14 minutes. A new casing patch was installed. The casing patch and casing was pressure tested to 1,870 psi for 20 minutes with pressure loss of 100 psi in 20 minutes in September 2010. In October 2010, the casing was pressure tested to 1,870 psi for 60 minutes and lost 425 psi in 60 minutes. As part of the RCA the casing × tubing annulus was filled on May 25, 2016. On June 8, 2016, the fluid level had dropped to 371 ft. SS-25A was temporarily plugged in May, June, and July 2017, with the top of cement at 2,576 ft in the 8 5/8 in. casing, covering the leaking stage collar.
- Well SS-25B was drilled in 1973. According to the well records two casing patches were set in 1976 across the stage collar (one was set too low). A temperature survey and R/A tracer survey in 1986 indicating a leaking casing patch at a leak rate of 25 Mcf/D according to an Interoffice Correspondence dated September 4, 1986 [12, pp. 127-138] (AC_CPUC_0001314 – AC_CPUC_0001325). In 1986, the two casing patches were removed. A pressure test on the casing to 1,500 psi lost 100 psi in two minutes. A casing patch was set across the stage collar and the casing was pressure tested to 1,500 psi.

Blade does not agree that a leaking stage collar ". . . is easily remedied with a simple casing repair" as stated in the Chapter I Reply Testimony document [1, p. 14]. A review of SoCalGas documents indicates otherwise. Refer to the SS-25A stage collar leak and attempts to repair it with casing patches as described above. A review of the SoCalGas casing leak list [11] of 81 line items shows the following large number of stage collar and casing patch leaks as the Cause of Leak:

- 14 instances of stage collar port leaking
- 15 instances of casing patch seal leaking

The list shows cement squeezes and casing patches were used to attempt to repair leaking stage collars. This resulted in multiple leaks reported in the same well. For example, FF-32C was listed four times with a stage collar leaking in 1974 followed by a casing patch installation. The casing patches leaked and were replaced in 1981 and 2000, and a cemented inner casing was installed in 2016.

It is apparent SoCalGas considered stage collars leaks as casing leaks because they quantified gas leak rates, listed them in their summary of casing leaks spreadsheet, and they attempted to repair them. Blade disagrees with the claim stated in Chapter I, page 13 – 14 that *". . . these stage collar leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well . . ."* Blade has seen no studies that show corrosion was not a factor in stage collar leaks. A leak in the stage collar clearly results "*in poor pressure integrity of the casing*" when the casing is a pressure vessel to contain well pressure.

One casing leak (Well P-47) identified by Blade was due to incompletely plugged water shut-off holes discovered in 1977. A water shut-off test is a well operation required by DOGGR that involves placing holes in the production casing and then conducting a pressure test (with water or other fluid) to confirm the integrity of the seal created by the cement behind the casing. After the test, the holes have to be cemented and closed. In certain instances, if the holes are incompletely closed and plugged, further work is required to seal the casing. This is standard practice. Water shut-off leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well, and no follow-up investigation or failure analysis is required to determine the obvious cause of these particular casing leaks of what is a simple mechanical issue.

Blade Response:

The well file for P-47 [13] was reviewed to follow up on the Hower and Stinson interpretation that a water shut-off hole was reported as a casing leak. The well records show that the water shut-off holes discovered in 1977 (page 32) were from a previous casing leak repair done in 1973 (page 46). The 5 in. liner leak between 8,038 and 8,056 ft was repaired by shooting squeeze holes at 8,056 ft and squeeze cementing in 1973. The squeeze job repair was pressure tested to 1,625 psi. WSO holes were perforated at 8,135 ft. The WSO test was witnessed and approved by the DOG (Division of Oil and Gas). In 1977, a leak was found in the 1973 WSO holes and a new leak was found at 7,328 ft in the 5 in. flush joint liner. Perforations were added as part of the workover. Therefore, Blade reiterates that P-47 exhibited a casing leak.

A further eight of the casing leaks (Wells F-3, FF-35C, P-32 2x, P-35, SS-4A, P-42C, and Ward-3A) identified by Blade were not leaks at all. These were situations where there was a suspicion of a potential leak, but further investigation by SoCalGas, such as pressure testing or noise logging, confirmed there was no leak to the exterior of the well. Or in the case of F-3 and P-32, SoCalGas discovered holes in an external casing, that had been protected by an inner string during gas

operations but the inner string was removed for purposes of the inspection. As such there was no leak. In the case of P-42C there was a hole in the liner top, an internal component of the well.

Blade Response:

Blade reviewed the well records again to determine if the reported leaks were valid or not. Our findings are summarized as follows:

- F-3 (Frew 3)—The well file [14, p. 161] (AC_BLD_0031799), shows the completion diagram as of September 1977, with 2 7/8 in. tubing with a packer at 7,650 ft in the 7 in. production casing. A casing leak with an underground blowout and the well kill occurred in 1984. The workover in 1986 found a hole in the 7 in. casing at 3,240 ft [14, pp. 116-118] (AC_BLD_0031754 – AC_BLD_0031756). The stated purpose of the workover was: "*GWO No. 90315 was issued to repair casing leak and run 5-1/2" inner string*". A hole in the 7 in. casing was identified at 3,240 ft using an inspection log and confirmed with a packer and pressure test of the casing above and below the hole. The hole was squeeze cemented and the 5 1/2 in. inner casing was run and set on a packer. The casing leak was in the 7 in. production casing before the inner casing was set, so the reported leak is valid. Additionally, F-3 is listed as a casing leak on the SoCalGas casing leak list [11].
- FF-35C—The 1990 Vertilog [15] showed a possible penetration in the 8 5/8 in. casing at 6,832 ft. The possible penetration identified by the Vertilog indicated areas of corrosion at other depths. The possible penetration was not verified by a pressure test to 1,500 psi in September 1990, a pressure that is significantly lower than the field operating pressure. A case can be made that in 1990 there was not a leak, but the inspection log data indicated serious wall loss and a 6 5/8 in. inner casing was run to isolate the 8 5/8 in. casing in 1990 according to the FF-35C well file [16, pp. 158-161].
- P-32—The well was converted to gas storage in 1972 with 2 7/8 in. tubing and a packer in the 7 in. casing. A leak in the 7 in. production casing between 4,510 and 4,590 ft was identified in September 1974 and squeeze cemented five times and pressure tested to 1,550 psi. according to the well file [17, pp. 38-41]. The 5 1/2 in. inner casing and packer was run after the squeeze job and pressure test in 1974. The casing leak was in the 7 in. casing before the inner casing was run and the reported leak is valid. Additional leaks were found in the 7 in. casing from 654 to 845 ft and 1,300 to 1,323 ft in 2016 [18, pp. 5-8]. The leaks were cement squeezed eight times and a 5 1/2 in. inner casing was run and cemented. Additionally, P-32 is listed as a casing leak on the SoCalGas casing leak list [11].
- P-35—The February 2016 Vertilog [19] showed 85%, 86%, and 61% wall thickness penetrations at 3,396 ft, 3,420 ft, and 3,464 ft, respectively. The casing was pressure tested in March 2016. The possible penetrations were not verified by a pressure test.
- SS-4A—The well file [20, p. 5] daily report for January 8, 1979, shows a leak in the 6 5/8 in. liner between 7,488 and 7,518 ft. The daily report for January 9, 1979 (page 5), shows a leak in the 6 5/8 in. liner between 4,291 and 4,296 ft. Both leaks were squeeze cemented. The well file [21, pp. 7-9] daily report for January 30, 2017 shows a leak between 753 and 860 ft in the 8 5/8 in. casing. The leak was squeeze cemented three times with a total of 304 bbl of cement. A 6 5/8 in. inner casing was run and cemented. Based on this information the reported leaks are valid. Additionally, SS-4A is listed as a casing leak on the SoCalGas casing leak list [11].

- P-42C—The well file [22, pp. 10-12] daily reports for November 11 – 28, 2016, show several pressure tests indicating a casing leak at or above the 7 5/8 in. liner top. The well was plugged back to 6,538 ft in December 2016, by setting a cement plug that covers the liner top. A pressure test after the plug was set showed a good pressure test of 1,098 psi. Based on this information the casing leak is valid.

  The last sentence of the paragraph states "In the case of P-42C there was a hole in the liner top, an internal component of the well." Blade's position is that the production liner top and liner are an extension of the production casing and are a pressure containing component of the wellbore and therefore a leak at the liner top causes loss of production casing pressure integrity. The well file [22, p. 42] has a wellbore schematic with the comment "*6553'-6877' damaged casing*". The liner top depth is 6,867 ft and the damaged casing is above the gas storage reservoir.

- Ward-3A—What appeared to be a casing leak in the well reports could have been a leaking retrievable bridge plug. The casing was subsequently pressure tested to 600 psi for 15 minutes from 2,593 ft to surface after the leaking bridge plug was identified in December 2016 [23, pp. 11-17]. The casing below 2,593 ft was not pressure tested according to Blades interpretation of daily reports. The 8 5/8 in. casing was perforated 2,060 – 2,055 ft and the 8 5/8 × 13 3/8 in. annulus was cemented. The casing from 2,593 ft to surface was pressure tested to 600 psi significantly below the field operating pressure. A 6 5/8 in. inner casing was cemented in place in February 2017, and the well was recompleted.

Blade's list of casing leaks included four instances (Wells P-32B 2x, SS-4A and MA-5A) of double and triple counting situations where two or more holes in a casing were discovered in a single inspection. These were not separate events, but rather singular investigations discovering multiple proximate holes. These should have only been counted once.

Blade Response:

Blade assumed that this statement accounts for 3 of the 31 casing leaks because SS-4A was counted in a previous statement.

Blade considered multiple leaks as individual leaks if they occurred at depths greater than approximately a joint length apart (approximately 40 ft). Details of the three wells are as follows:

- The P-32B caliper log showed up to three holes in the 8 5/8 in. casing at 7,207 ft, 7,250 ft, and 7,278 ft [24, p. 113].
- SS-4A had two leaks in the 6 5/8 in. liner 3,192 ft apart [21, p. 5] and a leak in the 8 5/8 in. casing (page 7).
- MA-5A was reviewed and a leak between 1,955 and 2,490 ft was confirmed and the leak between 1,600 and 1,955 ft was revised to between 1,445 and 2,500 ft [7, pp. 36-39].

Blade considers each of these leaks valid.

d. Provide all necessary documentation in support of the answer to question 1c or cite to sections of the Blade report that support your answers.

   Details and references are included in Question 1 c responses.

e. How would Blade re-word the two statements quoted so that Blade would agree with them?

Blade evaluated the 124 Aliso Canyon field wells classified as gas storage or gas storage/oil and gas by DOGGR in May 2018 to determine the historical condition of the production casings. It was important for the RCA to determine if there were any casing failures that were similar to the SS-25 failure. Wells drilled and completed as oil and gas wells were converted to gas storage wells and the condition of the production casing is critical for long life gas storage wells. The pressure loads on gas storage wells are more severe than typical oil and gas wells. The pressure loads on oil and gas wells normally decrease with time as the reservoir pressure depletes because of production. The pressure loads on gas storage wells are cyclical, usually on an annual cycle of injection and withdrawal. The wells are pressured back up to the field operating pressure after each withdrawal cycle. The maximum and minimum pressure loads are similar year after year, decade after decade.

The findings of the evaluation are summarized in the Blade Main Report [2, pp. 162-166]. The number of wells with failed casings was 49 with a total of 99 failures. The 99 failures included 63 casing leaks, 29 tight spots, 4 parted casing, and 3 classified as other. The timeframe of when the failures were identified ranged from before the field conversion to gas storage, during conversion, and after conversion to gas storage.

Conclusions can be made based on the evaluation of all casing failures in the field. Without some type of evaluation, it would not be possible to draw the following conclusions:

- Based on a review of the available well records, no casing failures were identified that closely resembled the external corrosion, ductile rupture, and brittle failure that caused the parted casing in the SS-25 well resulting in gas released to the atmosphere.
- None of the casing failures resulted in a reported surface release of gas similar to SS-25.
- Two wells had casing leaks where gas escaped into surrounding formations. The wells had leaks deeper than SS-25 and the wells were killed successfully.
- No reports were identified that showed any of the well failures were investigated to determine the root cause of the failure.

f. Specifically, how many of the “well casing issues” that Hower and Stinson characterize in this passage would Blade consider to be leaks?

Blade’s position is that 60 of the 63 “well casing issues” were leaks confirmed by typical field methods of leak detection, such as, failing to hold pressure during a pressure test and were reported accordingly on a daily well report. The three wells where a leak was not confirmed by a pressure test had inspection logs showing significant wall loss in two wells, and the third well was not fully pressure tested as discussed in Question 1 g.

SoCalGas developed a list of casing leaks [11] that was provided to Blade as a response to a data request. The discovery dates of the leaks ranged from 1973 through 2015. The Blade Main Report [2, pp. 166-169] includes a discussion of the SoCalGas casing leak list. The SoCalGas list included WSO perforation and casing shoe leaks that were not relevant to the RCA so those leaks were not included in the Blade casing leak list. Three of the wells that Hower and Stinson stated were not leaks (F-3, P-32, and SS-4A) are included on the SoCalGas list of casing leaks as indicated in the responses to Question 1 c.

g. What is the basis for this answer?

The 31 leaks challenged by Hower and Stinson are discussed in the Blade Responses in Question 1 c. Leaks in the three wells below were not confirmed by typical field methods. The production

casing was subsequently remediated by running inner casings (FF-35C and Ward-3A) and plug and abandonment (P-35). A summary of each of the three wells follows:

- The wall loss identified as a possible penetration at 6,832 ft in FF-35C was not confirmed by a pressure test in 1990. However, an inner casing was run to isolate the 8 5/8 in. casing following the casing inspection and a pressure test to 1,500 psi in 1990. The pressure test was significantly below the field operating pressure. A 7 in. inner casing was run and cemented in 2008.
- The wall losses identified as possible penetrations in P-35 were not confirmed by a pressure test. The well was plugged and abandoned in 2019 according to DOGGR records.
- What appeared to be a casing leak based on the Ward-3A daily reports could have been caused by multiple leaking retrievable bridge plugs (RBP). Following the pressure test to 600 psi from 2,593 ft to surface, a tight spot in the 8 5/8 in. casing was identified at 5,900 ft while running an RBP. The casing below 2,593 ft was not pressure tested according to the reports based on Blades interpretation of the daily reports. A casing tight spot was milled from 5,885 to 6,382 ft. The casing was perforated and cement was circulated in the 13 3/8 × 8 5/8 in. annulus. After cleaning out the 8 5/8 in. casing, a 6 5/8 in. inner casing was run and cemented and the well was recompleted and returned to service in 2017.

2.2 Question 2

2. On page 9, it states, “As of the date of the incident there was no documented industry standard related to investigation of casing failures in gas storage operations.”

2.2.1 Questions and Blade Responses

a. Does Blade agree with this statement?

Yes.

b. Even if there were no such documented industry standards as of the date of the incident, in Blade’s professional judgment, was it safe for SoCalGas to have operated its field without having investigated the cause of casing failures at its Aliso Canyon Natural Gas storage facility?

Blade is not in a position to judge whether it was safe for SoCalGas to operate its field.

c. Why or why not?

Not applicable. Blade conducted an RCA of the Uncontrolled Hydrocarbon Release from Aliso Canyon SS-25.

2.3 Question 3

3. On page 10, it states, “Blade states that “API RP 585 was developed for Pressure Equipment Integrity Incident Investigation,” not gas storage well integrity management and only “presents this as an option that could be applied” to gas storage. [Footnote omitted.]. Further Blade states that there “are no specific standards or practices related to ‘failure analysis or subsequent risk assessment’ related to gas storage well casings.”

2.3.1 Questions and Blade Responses

a. What is Blade's basis for saying that API RP 585 could be applied to gas storage?

Blade reviewed industry documents and standards to determine what failure analysis processes were available to identify the causes of casing failures. No failure analysis guidelines directly related to gas storage well failure analysis were identified. API RP 585 is relevant to the investigation of pressure equipment integrity including pressure containing components, piping, and other pressurized equipment. It also states other types of pressure equipment can be included at the discretion of the owner/user. Blade considers the production casing in a well to be a pressure containing vessel.

Blade's fundamental position is that casing failures need to be formally investigated so that the cause is identified and the potential implications are understood. Understanding and interpreting failures are critical to evaluating the propensity or risk of a similar failure field wide. Furthermore, the extent of a failure analysis should be commensurate with the type and nature of the failure. Not all failures require an investigation such as that done for SS-25. The cause may be straightforward, well-specific and easily mitigated. However, if the cause appears to be systemic, or the potential consequences are more serious, then a more comprehensive investigation is needed to evaluate the potential risks to other wells and to develop the appropriate mitigation steps.

Although API 585 was not written specifically for gas storage projects, Blade identified it as a solution as part of the RCA. Specifically, Blade stated that "gas storage regulations should require an API RP 585 Level 1 type analysis of all failures or near misses". Blade believes that API RP 585 could be applied to gas storage because:

- It provides a template for conducting failure analyses as a structured, systematic process that could be easily adapted for gas storage operations. It provides guidance on who should be involved in the investigation and the processes that should be followed.
- A Level 1 type analysis is a simple 1 or 2-person investigation that can be done in a fairly short period of time. It involves a review of the facts and the identification of the probable cause and corrective actions. Importantly, the results are documented so that potential trends that may suggest systematic issues can be identified and acted upon.
- It acknowledges that it is impractical and unnecessary to investigate every incident to the same level of detail, and that the scope and depth of an investigation should be based on how serious or potentially serious the incident was. Level 2 and 3 type analyses are available for higher consequence failure investigations.

b. In Blade's professional opinion would it have been a safe practice for SoCalGas to apply API RP 585 to gas storage well integrity management at Aliso Canyon natural gas storage facility?

Yes.

c. Why or why not?

A structured approach for the various investigation levels is recommended so that failures are investigated consistently and common information is collected for use in comparing and analyzing failures. Conducting failure analyses in a manner described in API RP 585 would be expected to improve safety. The results of a failure analysis provide the foundation for a risk assessment and development of mitigation procedures. Risk assessments are a fundamental part of a well

integrity management system which is intended to proactively identify and mitigate potential issues rather than reacting to issues that already exist.

2.4 Question 4

4. On pages 11 and 12, it states,

"It is also critical to note that of the casing failures documented by Blade, which provide the basis for SED's alleged violations, there was no pattern identified that would have led SoCalGas staff to determine that there was any sort of systemic issue that would have indicated that an SS25 type failure was likely. According to Blade:

> Wells with casing failures were distributed throughout the Aliso Canyon Field. Nothing seems unusual regarding the casing failures near SS-25 when comparing them to casing failures in the rest of the field. The depths of casing failures ranged from the wellhead to below 8,000 feet, and *no general pattern is apparent*. [Footnote omitted] (Emphasis in SoCalGas testimony, but not in original.)

Further, Blade stated that "52% of the leaks were between surface and 4,000 ft. with no trend of leak count vs. depth." [Footnote omitted). Finally, Blade stated that "[t]he failure and casing leak rate for the gas storage wells is around 50%, implying that well age does not correlate with casing failures." [Footnote omitted.]

With these passages in mind, please answer the following:

2.4.1 Questions and Blade Responses

a. If SoCalGas had investigated and/or analyzed the casing failures in a fashion recommended by Blade, could they have found any patterns related to the causes of the casing failures?

> As described in the Blade reports, no patterns of casing failures were identified, based on the data available. However, it is not known if a pattern might have been identified if failure investigations had been undertaken.

b. If so, what sorts of patterns might have been found?

> No patterns in the casing failures were identified from the Blade analysis and it is unknown what patterns might have been found if failures prior to October 2015 had been investigated.
>
> A failure investigation of casing OD corrosion in other wells might have directed attention to SS-25 and other similar wells. As was stated in Section 5.2.2, page 216 in Blade's Main Report, *"Despite the number of casing failures that had occurred in the field, no failure analysis or subsequent risk assessment was done that may have led to an awareness that corrosion was a potential problem."*

c. In Blade's experience and knowledge, have there been investigations or analyses of casing failures in other natural gas storage facilities?

> Blade is not aware of investigations or analysis of casing failures in other natural gas storage facilities. However, it should be noted that the concept of conducting failure investigations is not new or revelatory. Failure investigations have been done in the oil and gas industry for decades irrespective of whether or not it was a regulatory requirement.

d. If the answer to question 4c is yes, have such investigations or analyses revealed patterns related to the causes of those casing failures?

Not applicable. Blade is not aware of investigations or analysis of casing failures in other natural gas storage facilities.

3 References

[1] SoCalGas, "1_Ch. 1 - MHA - Hower and Stinson (A Final).pdf," 2020.

[2] Blade Energy Partners, "Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon SS-25," 2019.

[3] SoCalGas, "Porter 44 SIMP Program, Casing Patch Requirement, February 25, 2016, AC_BLD_0113490".

[4] Blade Energy Partners, "Analysis of Aliso Canyon Gas Storage Wells with Casing Failures, Volume 4 - Aliso Canyon Casing Integrity.pdf," 2019.

[5] SoCalGas, "SS-25A Well Documentation (from SoCalGas)_N.pdf".

[6] SoCalGas, "P-42B 03721877_DATA_03-19-2008.pdf".

[7] SoCalGas, "MA-5A 03722309_DATA_03-20-2008.pdf".

[8] Standards Norway, "NORSOK Standard D-010, Well Integrity in Drilling and Well Operations, Rev 4," June 2013.

[9] SoCalGas, "Interoffice Correspondence, Aliso Canyon - Porter 44 and Standard Sesnon 5 - Second Remedial Operations under G.W.O. 97904-69, November 25, 1977, AC_BLD_0121176, AC_BLD_0121177, AC_BLD_0121180".

[10] Schlumberger, "MA-1B USIT AC_BLD_0067595.pdf," 2017.

[11] SoCalGas, "AC_BLD_0075728.pdf".

[12] SoCalGas, "SS-25B Well Documentation (from SoCalGas)_N.pdf".

[13] SoCalGas, "P-47 03700734_DATA_03-19-2008.pdf".

[14] SoCalGas, "Frew 3 Well Documentation from SoCal.pdf".

[15] Baker Hughes, "FF-35C 03721279 Vertilog_09-18-90.pdf".

[16] SoCalGas, "FF-35C 03721279 Data_03-14-08.pdf".

[17] SoCalGas, "Porter-32 03700719_DATA_03-19-2008.pdf".

[18] SoCalGas, "P-32 03700719 Data_03-19-08.pdf".

[19] Baker Hughes, "P-35 03700722_HRVRT_02-26-16 ano II.pdf".

[20] SoCalGas, "SS-4A 03721375_DATA_03-19-2008.pdf".

[21] SoCalGas, "SS-4A (2) 03721375_DATA_03-19-2008.pdf".

[22] SoCalGas, "P-42C 03721878 Data_01-20-17.pdf".

[23] SoCalGas, "Ward-3A 03722306_DATA_03-20-2008.pdf".

[24] SoCalGas, "P-32B 03721276_DATA_03-19-2008.pdf".

SED SUR_REPLY_000315

Privileged and Confidential Draft
Contains Attorney Work Product

Order Instituting Investigation on the Commission's Own Motion into the Operations and Practices of Southern California Gas Company with Respect to the Aliso Canyon storage facility and the release of natural gas, and Order to Show Cause Why Southern California Gas Company Should Not Be Sanctioned for Allowing the Uncontrolled Release of Natural Gas from Its Aliso Canyon Storage Facility. (U904G).	I.19-06-016 (Filed June 27, 2019)

PREPARED EXPERT TESTIMONY OF MHA PETROLEUM CONSULTANTS ON BEHALF OF SOUTHERN CALIFORNIA GAS COMPANY (U 904 G)

(SOCALGAS MANAGED THE ALISO CANYON OIL FIELD AND THE SS-25 WELL IN A REASONABLE MANNER IN ACCORDANCE WITH INDUSTRY STANDARD PRACTICES)

March 20, 2020

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CHAPTER XX

SOCALGAS OPERATED SS-25 AND THE ALISO CANYON FIELD REASONABLY AND CONSISTENT WITH INDUSTRY STANDARD PRACTICES

The purpose of the following prepared reply testimony, submitted on behalf of the Southern California Gas Company ("SoCalGas"), is to address the testimonies of Margaret Felts on behalf of the California Public Utilities Commission's Safety Enforcement Division ("SED")[1] and Mina Botros, Alan Bach, Matthew Taul, Pui-Wa Li, and Tyler Holzschuh on behalf of the Public Advocates Offices ("Cal Advocates"). SED alleges SoCalGas violated California Public Utilities Code Section 451 (Section 451) because it did not conduct failure analyses at Aliso Canyon (Violations 1-60),[2] failed to follow its plan to check the casing of 13 wells for metal loss (Violations 61-73),[3] operated SS-25 without a backup mechanical barrier to the production casing (Violation 77),[4] did not have a policy that required well casing wall thickness inspection and measurement (Violation 78),[5] did not appropriately understand and address groundwater (Violations 84-85),[6] did not fully cement or cathodically protect the casing against corrosion (Violation 86),[7] failed to have a continuous pressure monitoring system and thereby prevented immediate identification of the leak (Violation 87),[8] and had imprudent and unreasonable recordkeeping practices (Violations 327-329).[9] Cal Advocates alleges further that SoCalGas did

[1] SED's Opening Testimony was served on parties to I.19-06-016 on November 22, 2019 without an identified witness, and remains so. Pursuant to SoCalGas Data Request 2 to SED, SED identified Margaret Felts as the sponsoring witness for the entirety of SED's Opening Testimony.

[2] SED Opening Testimony at 7.

[3] Id. at 10.

[4] Id. at 18.

[5] Id. at 25.

[6] Id. at 39.

[7] Id. at 45.

[8] Id. at 47.

[9] Id. at 67.

not identify and resolve well integrity issues,[10] did not conduct failure analyses,[11] did not take prudent action on the circa 1988 Vertilog results,[12] and generally failed to take a proactive approach to maintaining the Aliso Canyon facility.[13] However, these allegations are incorrect and/or misguided, as explained in detail below. SoCalGas did conduct appropriate failure analyses, had well monitoring programs that became more proactive as technological advancements in tools allowed, and had an understanding of groundwater levels consistent with what was necessary. Moreover, SoCalGas' practices were consistent with or exceeded what we have observed in the industry. Even today, dual barrier designs are not industry standard, nor is cathodic protection. And, real-time pressure monitoring would not have informed how the SS-25 leak was addressed. Finally, compared to what we have seen at other operators in the industry, SoCalGas' records are well organized and contain the appropriate and necessary information.

Mr. Hower's and Mr. Stinson's expertise is based on significant experience in the gas storage industry. Tim Hower and Charlie Stinson, have over 75 years of collective experience in the natural gas and natural gas storage industries. Mr. Hower's experience includes the evaluation and optimization of underground gas storage projects located in the U.S., Europe and Australia. He has conducted industry training courses on the engineering of gas storage reservoirs, and he has co-authored an industry textbook on gas storage reservoir management.[14] Much of Mr. Hower's experience has involved working directly with the operation engineers and staff at the natural gas storage facilities ensuring that their field management techniques conform to industry standard practices. Mr. Hower has previously testified as an Expert on gas storage industry standard practices before numerous jurisdictions and regulatory bodies.

Mr. Stinson's experience includes the permitting, development and operations of underground storage facilities in Oregon and California, both as an employee of operating

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[10] CA Advocates Opening Testimony at 3.

[11] Id. at 13.

[12] Id. at 3.

[13] Id. at 13.

[14] Paul S. Schafer, Tim Hower & Raymond W. Owens, Managing Water-Drive Gas Reservoirs (Gas Research Institute 1993).

companies (1978 to 2011) as well as a professional engineering consultant (2011 to present). In addition, Mr. Stinson served on the American Gas Association Underground Gas Storage committee for over 20 years, including one year as its chairman. This committee served as a platform for gas storage operators to share emerging technologies, current industry standard practices, development and operating challenges, regulatory changes, and a host of other issues facing their companies. As a result of committee meetings held at various operating company sites, Mr. Stinson has toured over 30 gas storage fields in 13 states.

I. GENERAL DISCUSSION REGARDING INDUSTRY STANDARDS AND SOCALGAS' OPERATIONS.

In considering whether SoCalGas acted reasonably with respect to operation and maintenance of the Aliso Canyon gas storage field prior to the 2015 Aliso Canyon incident it is necessary to assess the relevant industry standards that applied at the time. Based on our knowledge and experience from working onsite at 60 U.S. gas storage fields, and working with engineers and field data on approximately 135 gas storage fields over the past 40 years, we have first-hand knowledge gas storage operations and standard practices.

Prior to September 2015 and the publication of API Recommended Practice ("RP") 1171 ("API RP 1171"), "Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs," there were no documented gas storage industry-wide procedures that would have been considered industry standard practice.[15] Even now, API RP 1171 remains a "Recommended Practice,"[16] which is in the process of implementation and does not qualify as an industry standard.

Of course, even absent formal documented standards, there were industry standard practices even if they were not recorded or documented. The following is a summary table comparing applicable Division of Oil, Gas and Geothermal Resources ("DOGGR"), now renamed

[15] For purposes of this testimony "industry standard practice" means prevailing practice within the industry.

[16] *See* Pipeline and Hazardous Materials Storage Administration, Underground Natural Gas Storage (2020), https://www.phmsa.dot.gov/pipeline/underground-natural-gas-storage/underground-natural-gas-storage (referring to API RP 1170 and 1171 as a "recommended practices"). In the final rule, PHMSA adopted most of the recommendations in 1171 with some changes, mostly related to compliance deadlines. *See* Pipeline Safety: Safety of Underground Natural Gas Storage Facilities, 85 Fed. Reg. 8104 (Feb. 12, 2020) (adopting the recommended practices of API RP 1171 with changes based on comments on the interim final rule).

The Geologic Energy Management Division ("CalGEM"), regulations in effect at the time of the SS-25 release, the API RP 1171 recommendations, standard industry practices we observed, and those utilized at Aliso Canyon as of October 23, 2015:

STORAGE ATTRIBUTE	DOGGR REGULATIONS AS OF 10/23/2015[17]	API RP 1171RECOMMENDED PRACTICES[18]	INDUSTRY STANDARD PRACTICE AS OF 10/23/2015[19]	PRACTICE AT ALISO CANYON AS OF 10/23/2015
Maximum Operating Reservoir Pressure	Defined by permit (3,600 psi for Aliso)[20]	Not specified	36% of storage reservoirs operate higher than original discovery (delta pressure)[21]	Original discovery only. Delta pressure approved by DOGGR but never implemented
Mechanical Integrity Test - Original	Within 3 months of initial operations	Well mechanical integrity tests required	Tested during well completion operations	Tests completed during well conversion - completion
Mechanical Integrity Test - Operations	Annual temperature surveys	Wells monitored for unexpected conditions	Annual temperature surveys	Wells visited daily. Temp logs ran annually.
Well Casing Design	Dual barrier not required	Dual barrier not required	87% of all gas storage wells are single barrier[22]	Packer installed. Single barrier operation.
Cement Bond Log	Required	Required	Typically completed	Completed on all wells

[17] *See* Cal. Code Reg. § 1724 - §1724.10, et seq.

[18] *See* API 1171

[19] Based on personal knowledge and experience of Tim Hower and Charlie Stinson.

[20] DOGGR Project Approval Letter, April 18, 1989; revised July 26, 1989.

[21] Based on the personal knowledge and experience of Charlie Stinson. [This is based off of an informal study by the AGA done at the request of Charlie (after he left the organization) and while there is a spreadsheet of responses which generated this number, its not something that MHA or Charlie owns or has access to].

[22] Underground Natural Gas Storage Operators "Tubing and Packers in Underground Natural Gas Storage: Safety and Reliability Considerations", AGA/API/INGAA Underground Natural Gas Storage Joint Industry Task Force, September 16, 2016.

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Max Age of Storage Wells	None specified	None specified	~~Average~~ Median age of repurposed wells is 74~~8~~ years[23]	SS-25 was 61 years old at the time of failure
Well Integrity Monitoring	Not required	Monitor for annular pressure	No programmatic application	Integrity logs run during well reworks
Wellsite Inspections	Not specified	Annual inspections	Highly variable	Daily visits. Monthly inspections.
Pressure Monitoring	Surface pressures weekly	Not required	Highly variable	Recorded weekly
Reservoir Integrity Monitoring	Not required	Material balance required periodically	Completed periodically	Inventory verification completed periodically
Production Casing Cement-to-Surface for Existing Wells	Not required	Not required	Highly variable	Completed in new wells post 1990
Emergency Shutdown Valves	Not required[24]	Not required. Operator to evaluate need based on criteria.	~~Some surface~~Only 11% of surface ESDs installed. Only 3% have SSSv[25]	All IW wells with surface ESDs. SSSVs attempted but proved to be unreliable
Emergency Shutdown Valve Testing	Not required	At least annually	Highly variable	Semi-annually

[23] Drew R. Michanowicz, et al., 2017 Env. Res. Lett. 12, 1 (2017).

[24] DOGGR regulations require emergency shutdown valves for critical wells only. Cal. Code Reg. § 1724.3. DOGGR defines a "critical well" as a well within 300 feet of "any building intended for human occupancy that is not necessary to the operation of the well; or any airport runway" or within 100 of "[a]ny dedicated public street, highway, or nearest rail of an operating railway that is in general use; [a]ny navigable body of water or watercourse perennially covered by water; [a]ny public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population; or [a]ny officially recognized wildlife preserve." Cal. Code Reg. § 1720. Regardless, Aliso Canyon does not have any critical wells.

[25] Underground Natural Gas Storage Integrity & Safe Operations (July 6, 2016), available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/underground-natural-gas-storage/59336/aga-white-paper-ungs-integrity-and-safe-ops-20160706.pdf at 53-54.

Emergency Response Plan	Not required	Required	Typically completed	Completed
Well Flow Testing	Not required	Not specified	Highly variable	Periodic well flow tests for erosion control
Operation & Maintenance Procedures - Wells	Not required	Required	Typically completed	Completed
Risk Management Plan	Not required	Required	Typically informal only with little or no documentation	Informal pre-2007, Inspect and Replace, SIMP in early implementation as of 10/23/3015
Well Kill System	Not required	Not required	Not installed	Installed on all injection/withdrawal wells

In addition to API RP 1171, and subsequent to its publication, various members of gas industry associations developed a joint industry task force ("JITF") paper, "Underground Natural Gas Storage – Integrity & Safe Operations" published in July 2016.[26] The JITF observed that "[o]perators have projected full conformance with API 1171 following a final rulemaking could take 7-10 years. . .."[27] While the industry recognizes API RP 1171 as a common industry recommended practice, most operators's field facilities and operations will not be compliant for several years.[28]

[26] Underground Natural Gas Storage Integrity & Safe Operations (July 6, 2016), available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/underground-natural-gas-storage/59336/aga-white-paper-ungs-integrity-and-safe-ops-20160706.pdf.

[27] Id. at 4.

[28] Id. *See also* Pipeline Safety: Safety of Underground Natural Gas Storage Facilities, 85 Fed. Reg. 8104 (Feb. 12, 2020) (noting the changes in compliance deadlines under the final rule (adopting, in part, RP 1171). Specifically, while written programs need to be in place for an integrity management framework within a year after the effective date, PHMSA does not expect parties to begin risk assessments until much later – providing four years from the effective date to do initial assessments of 40% of wellbores, wellheads and associated components. Moreover, PHMSA adopted these regulations in response to the Aliso Canyon incident). Additionally, DOGGR's regulations put in place post-incident contain long lead times to allow operators to prepare for compliance. *See, e.g.,* Cal. Code Reg. § 1726.3(d)(1) (allowing seven years after effectiveness of the regulations for initial compliance).

SED's testimony fails to identify any violation of industry standards by SoCalGas. In addition, SED has generally demonstrated a lack of knowledge and understanding of gas storage industry standard practice. In response to SoCalGas discovery requests, SED has produced numerous documents that it alleges are indicative of "industry standards."[29] Many of these are industry association technical research reports and case study papers. Notably, the research and case study papers provided by SED are not indicative of industry standard practice because they are not representative of gas storage operators' prevailing practices. Further, SED objected to SoCalGas' questions about what SED contends SoCalGas should have done with respect to various operations and maintenance practices. SED responded simply that it was not SED's job to know how to operate a gas storage field.[30] Finally, we note that while we are responding to individual allegations made by SED and Cal Advocates, many of the violations and allegations overlap and asserted are based on the same underlying concepts and issues. Therefore, this testimony should be taken *as a whole* – the responses to individual allegations should be taken to respond to the specific allegations identified in each section as well as any other allegations related to the same underlying factual issue.

III. SOCAL GAS ACTED REASONABLY IN INVESTIGATING PRIOR "LEAKS" AT THE FACILITY

As discussed below, SoCalGas met or exceeded gas storage industry and industry standard practices regarding well failures and subsequent investigation into their causes. Moreover, SED and Blade mischaracterize the 60 or 63 well casing issues of varying cause and degree as

[29] *See, e.g.*, SED Supplemental Data Response to SoCalGas Data Request 3 (as supplemented Jan. 23, 2020), SED responses to questions 7(b) (naming 2007.0101.NACE-SP0186-NN as an alleged industry standard), 9(a) (citing scholarly articles and various other papers), 9(b) (same), 10(c) (same). Based on the dearth of formal industry standards, we use the term "industry standards" throughout this testimony to refer to the consistent practices we have observed first-hand through our work experiences.

[30] *See, e.g.*, SED Supplemental Data Response to SoCalGas Data Request 3 (as supplemented Jan. 23, 2020), SED responses to questions 1(a), 2(a), 3(a), 4(a), 5(a), 7(a), 8(a), 9(a), 10(a), and 11(d). While objecting, SED noted that it is "SoCalGas' (not SED's) mandated responsibility, pursuant to California Public Utilities Code Section 451" [to determine what adequate (reasonable) measures might be in a specific scenario]. *See also* Felts Depo. Tr., 215:22 – 216:1 (Counsel for SED representing Ms. Felt's at the deposition objecting and stating that "[i]t is not safety and enforcement division's role to identify the kinds of investigations that Southern California Gas company should be doing on its own field."). Later, the same counsel, in a separate objection, noted that it was "beyond the scope of SED's purview" to recommend how to investigate. Id. at 252:10-14.

"leaks."[31] Indeed, the number of actual casing leaks is less than half that number, and only two of those (FF-34A and Frew 3) were of the scale where gas migrated some distance in the subsurface away from the wellbore.[32]

A. SoCalGas Detected, Investigated, and Remediated Well Casing Issues Consistent with Industry Standards

In its summary of violations, SED alleges 60 violations related to SoCalGas' alleged failure to adequately investigate casing "leaks."[33] SED alleges that "SoCalGas did not investigate or analyze its past casing leaks of other wells at Aliso Canyon. Moreover, in its recommendations for fixes to SoCalGas's system, SED states that "SoCalGas should be required to do a[n API Recommended Practice 585] level 1 analysis of all failures."[34] Importantly, however, aside from citing to API 585, SED fails to identify any particular deficiency or describe what precisely SED believes SoCalGas should have done. In response to questions from SoCalGas on this issue, SED objected that "[i]t is not safety and enforcement division's role to identify the kinds of investigations that Southern California Gas company should be doing on its own field."[35] Later, in a separate objection, SED noted that it was "beyond the scope of SED's purview" to recommend how to investigate.[36]

As of the date of the incident there was no documented industry standard related to investigation of casing failures in gas storage operations. In April 2014, API published Recommended Practice 585, "Pressure Equipment Integrity Incident Investigation" ("API RP 585").[37] It is important to note that this Recommended Practice does not apply to gas storage

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[31] Note that SED's summary of violations lists 60 violations for "leaks," while the Blade Report lists 63 "casing leaks." SED Testimony at 2; Blade Report at 2. Even more unclear, SED states that there were "*over* 60 casing leaks at Aliso Canyon before the SS-25 incident." SED Testimony at 7. However, "[t]o avoid double counting violations that the 60 leaks identified before the Aliso Canyon included the six blowouts and parted casings identified above." Id. at 9; *see* section III-B for further discussion of the number of "leaks."

[32] *See* Vol. 4, Blade Report at 51 ("Frew 3 and FF-34A had casing leaks and underground flow and were killed by pumping down the tubing.").

[33] SED Testimony at 2.

[34] SED Testimony at 79.

[35] Felts Depo. Tr., 215:22 – 216:1.

[36] *Id*. at 252:10-14.

[37] *Pressure Equipment Integrity Incident Investigation*, API RP 585 (1st ed., Apr. 2014).

operations; it documents and details procedures for conducting incident investigations for other forms of "pressure equipment."[38] Blade states that "API RP 585 was developed for Pressure Equipment Integrity Incident Investigation," not gas storage well integrity management and only "presents this as an option that *could* be applied" to gas storage.[39] Further, Blade states that there "are no specific standards or practices related to 'failure analysis or subsequent risk assessment' related to gas storage well casings."[40] We note, however, that while API RP 585 does not apply to gas storage and was not issued until 2014, SoCalGas' practices with respect to investigating well casing issues is consistent with

More importantly, SoCalGas' practices regarding investigation and assessment of well casing failures were consistent with standard practice across the gas storage industry. Minor casing leaks or mechanical issues were inspected running a casing inspection log, determining the location of the leak or issue, and remediating the leak or issues via a well workover. Based on information collected from the casing inspection log and other tests and observations made in the course of the workover SoCalGas was often able to assess the probable cause or causes of the issue. If a pattern of failures developed, (for example erosion from sand production), then a more detailed investigation was conducted and a risk management plan was employed to minimize the potential impact of recurrence.[41] Continuing the erosion from sand production example, SoCalGas routinely conducted sand flow tests to determine critical gas flow rates for sand production in the storage wells.

Where circumstances warranted, SoCalGas performed more extensive investigations. Examples of this include work done to address leaks at wells FF-34A and Frew 3, where SoCalGas observed migration of gas in the subsurface away from the wellbores. SoCalGas'

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[38] Note that Blade states that "API RP 585 was developed for Pressure Equipment Integrity Incident Investigation," not gas storage well integrity management and only "presents this as an option that could be applied" to gas storage. Blade response to the SED Data Request SED DR-49 at 14. Further, Blade states that there "are no specific standards or practices related to 'failure analysis or subsequent risk assessment' related to gas storage well casings." See Blade Response to SoCalGas Data Request, Feb. 14, 2020, at 13.

[39] *See* Blade response to the SED Data Request SED DR-49 at 14.

[40] *See* Blade Response to SoCalGas Data Request, Feb. 14, 2020, at 13.

investigations included gas sampling to confirm the source of the leaking gas and analysis of offset wells to determine the extent of gas migration away from the well with the casing leak,[42] as well as construction of numerical simulation models to determine the volume and the areal extent of the leaked gas.[43]

It is important to note that conducting a full Root Cause Analysis, of the sort performed by Blade in connection with the leak at SS 25, is most certainly not industry standard practice. Cutting and extracting the production casing, for direct examination and testing of a failed joint more than thousand feet below ground, is often not feasible. Nor is it reasonable or justifiable to perform such analysis for most casing failures.

It is also critical to note that of the casing failures documented by Blade, which provide the basis for SED's alleged violations, -there was no pattern identified that would have led SoCalGas staff to determine that there was any sort of systemic issue that would have indicated that an SS 25 type failure was likely. According to Blade:

> "Wells with casing failures were distributed throughout the Aliso Canyon Field. Nothing seems unusual regarding the casing failures near SS-25 when comparing them to the casing failures in the rest of the field. The depths of casing failures ranged from the wellhead to below 8,000 feet, and *no general pattern is apparent*."[44]

Further, Blade stated that "52% of the leaks were between surface and 4,000 ft. with no trend of leak count vs. depth."[45] Finally, Blade stated that "[t]he failure and casing leak rate for the gas storage wells is around 50%, implying that well age does not correlate with casing failures."[46] All prior well failures had been identified by SoCalGas within a timely manner, were contained locally, and were mitigated properly.

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[42] SCG00195774.

[43] AC_BLD_0033633.

[44] Blade Report at 204 (emphasis added).

[45] Id. at 166.

[46] Id. at 204.

B. Many of the Casing "Leaks" Identified by SED Were Insignificant and Are Irrelevant to What Occurred at SS 25.

SED alleges that:

> "SoCalGas failed to perform failure investigations, failure analyses or root cause analyses on failed Aliso Canyon wells despite more than 60 well casings experiencing leaks, four having parted casings, and several wells having casing corrosion identified."[47] Therefore, SoCalGas lacked important information and background to properly anticipate the extent and consequences of corrosion in its other wells, including well SS-25."[48]

SED's assertion, which is based solely on Blade's report,[49] mischaracterizes 60 well casing issues of varying cause and degree as relevant "leaks." SED seeks to show a "pattern of SED's and Blade's assertions appear to be premised on the assumption that these casing issues were somehow similar to the circumstances that led to the failure at SS-25.[50] In fact, Blade's report combines a number of different well conditions as "leaks," including perforations intentionally made by SoCalGas for water shut off tests and stage collar leaks. These well conditions have no relation to corrosion and present little risk or reason for concern. Many of these "leaks" were not even gas leaks, but rather were discovered during the conversion of the field to underground gas storage (when a well was not flowing or holding gas), initial drilling of a new storage well. Others on the list were either not leaks at all or double or triple counted leaks from the same event.

Blade's list of 63 relevant casing failures incorrectly includes the following:

- Eleven casing leaks (Wells P-12, SS-14, SS-17, P-47, P-25R 4x, FF-35E 2x and SF-2) identified by Blade were actually discovered in wells before SoCalGas operated the field or during initial conversion of the field to underground gas storage. One of these leaks (SS-17) happened in 1952 and occurred during the original drilling of an oil and gas production well by SoCalGas' predecessor. This leak occurred 20 years before the conversion of the field to gas storage and cannot be attributed to SoCalGas storage operations and need not have been investigated by SoCalGas. The other ten leaks that were identified during the conversion to underground gas storage. SoCalGas' identification and remediation of these casing

[47] SED Opening Testimony at 7.

[48] Id.

[49] *See, e.g.*, Blade Report at 4.

[50] SED specifically alleges that the alleged lack of follow-up investigation, failure analyses, or root cause analyses of these alleged prior leaks is a "root cause" of the SS-25 incident. *See* SED Opening Testimony at 7.

failures simply validates the process that SoCalGas used to inspect and repair, if necessary, all wells prior to putting them into service for gas storage. This is exactly how a conversion process should be performed in a depleted oil or gas field.

- One leak occurred in 1979 (Well MA-1B) during initial drilling and completion operations for new storage wells.[51] This leak, occurring during a pressurization test with water during drilling, had nothing to do with underground storage operations and was rectified prior to the well ever being put into service for gas storage.[52] Moreover, this leak was much shallower than the leak at SS-25.

- Seven of the casing leaks (Wells FF-32F, SS-25A, FF-32E, P-26B, SS-25B, FF-35B, and SS-44A) identified by Blade and forming the basis of seven SED violations were actually leaking stage collars.[53] Stage collars are devices used for multi-stage cementing of production casing in wells.[54] The stage collar is essentially a sliding valve in the casing that can be opened to allow cement to be pumped outside of the casing into the annulus between the production casing and the wellbore. It is quite common for stage collars to not seal completely upon closing the sliding valve after the cementing procedure. This situation is easily remedied with a simple casing repair. More importantly, these stage collar leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well, and no follow-up investigation or failure analysis is required to determine the obvious root cause of these particular casing leaks, which are common across the entire gas industry.

- One casing leak (Well P-47) identified by Blade was due to incompletely plugged water shut-off holes discovered in 1977. A water shut-off test is a well operation required by DOGGR that involves placing holes in the production casing and then conducting a pressure test (with water or other fluid) to confirm the integrity of the seal created by the cement behind the casing. After the test, the holes have to be cemented and closed. In certain instances, if the holes are incompletely closed and plugged, further work is required to seal the casing. This is standard practice. Water shut-off leaks have absolutely nothing to do with corrosion or poor integrity of the casing in the well, and no follow-up investigation or failure analysis is required to determine the obvious cause of these particular casing leaks of what is a simple mechanical issue.

- A further eight of the casing leaks (Wells F-3, FF-35C, P-32 2x, P-35, SS-4A, P-42C, and Ward-3A) identified by Blade were not leaks at all. These were situations where there was a suspicion of a potential leak, but further investigation by SoCalGas, such as pressure testing, confirmed there was no leak.[55]

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[51] Vol. 4, Blade Report at 15.

[52] Vol. 4, Blade Report at 29.

[53] Vol. 4, Blade Report at 25-28, 39.

[54] See Vol. 4, Blade Report at 13 ("The well design included a cement stage collar to pump a two-stage cement job").

[55] This further goes to refuting SED's allegations that SoCalGas somehow "failed to perform failure investigations."

- Blade's list of casing leaks included four instances (Wells P-32B 2x, SS-4A and MA-5A) of double and triple counting situations where two or more holes in a casing were discovered in a single inspection.[56] These were not separate events, but rather singular investigations discovering multiple proximate holes. These should have only been counted once.

In summary, rather than 63 casing "leaks," as alleged by SED, in fact there were less than half that number. There were 31 casing "leaks" documented by Blade which were not leaks at all, were double or triple counted leaks from the same event, or did not occur during the conversion of the field to underground gas storage, initial drilling of a new storage well, routine casing repairs of stage collars, and a water shut-off test. Further, only two of the actual casing leaks documented by Blade (FF-34A and Frew 3) involved situations where gas was known to have migrated some distance in the subsurface away from the wellbore.

IV. SOCALGAS USED REASONABLE INDUSTRY PRACTICES TO PREVENT AND MEASURE CORROSION.

SED makes a number of allegations regarding corrosion and the impact of such corrosion on causing the incident. However, SED's allegations appear to be based on misunderstandings, are contradicted by the Blade report or are simply irrelevant to whether or not SoCalGas acted reasonably in operating the Aliso Canyon Facility.

A. Corrosion from Groundwater Did Not Create the Holes on the 7-Inch Production Casing

SED alleges that SoCalGas failed to investigate specific corrosion problems at SS-25.[57] Although unclear, SED's testimony appears to assume that the 58 holes in the surface casing were due to corrosion, caused the corrosion and resulting failure on the SS-25 production casing, and could have been identified using the various technologies listed in the statement. SED states that "Blade identified a total of 58 through-wall-metal-loss holes in the 990-foot deep, 11-3/4-inch diameter steel surface casing walls of well SS-25. Fifty of the steel surface casing holes in SS-25 were identified at depths ranging between approximately 150 feet and approximately 195 feet. The through-wall-metal-loss holes were identified using various technologies, including caliper,

[56] Vol. 4, Blade Report at 24-25, 28-29, 31.

[57] Blade Report at 11.

Ultrasonic Corrosion Imaging (UCI) and High Resolution Vertilog (HRVRT). Camera logging data were consistent with the technology logging data, with photographs matching the sensory logging tools' metal loss locations." This logic is flawed and the allegations are without support.

However, SED's testimony fails to mention that Blade concluded that the incident itself, not corrosion, likely caused the holes. While the groundwater may have "accessed" the surface casing and there might have been corrosion on the outside of the surface casing, there is no evidence that this corrosion compromised the integrity of the surface casing. In fact, Blade concluded that the holes found in the surface casing were likely a consequence of the pressure surge caused by the axial rupture of the production casing and, thus occurred post-leak.[58] Since there is no evidence that the integrity of the surface casing led to the SS-25 leak, and since it is very likely that the holes were caused by, and not a consequence of, the incident, the reference to the holes in the surface casing in this section of the SED testimony is irrelevant.

B. <u>There Were and Are No Tools Available to Perform the Kind of Inspections SED Demands</u>

In connection with violations 83, 84 and 85, related to SoCalGas' alleged failure to discover specific corrosion problems on Well SS-25, SED states that "[c]orrosion was not detected on SS-25 because the seven inch casing wall thickness on the SS-25 had never been inspected."[59] SED further alleges that "[v]arious tools [could have been] run in a well with wireline to measure well thickness along the entire length of the casing or tubing casing. These logs were not run in the seven inch casing of well SS-25."[60]

The testimony from SED and CA Advocates implies that various technologies were available which could have easily identified these holes.[61] This is incorrect. Blade was able to

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[58] Blade Report at 119. Blade states that "[s]ome of these approximately 58 holes [in the 11 ¾-in surface casing] could have existed prior to the 7 in. casing axial rupture," but that "[m]any of the holes exhibited sharp corners that may have been more typical of a burst failure, implying that they occurred due to a pressure surge in the surface casing."

[59] Blade Report at 16. It should also be noted that SED's apparent premise underlying this argument is that SoCalGas failed to inspect and identify the 58 holes in the surface casing described above in Section III-A. However, as noted above, Blade determined the holes were most likely caused by the incident itself. It would likely have been impossible for SoCalGas to have found these holes using any inspection techniques.

[60] Id.

[61] *See* CA Advocates Opening Testimony at 3-4, 6-7. In fact, CA Advocates openly states that SoCalGas would have been able to identify corrosion as far back as 1988. Id. at 9 ("Had SoCalGas' management properly

analyze the surface casing and identify the holes only because the production casing had been *cut off and extracted* from the SS-25 well after the incident. Extracting the production casing exposed the surface casing for inspection and examination. During the normal operation of the SS-25 well, the production casing, of course, would have remained cemented in the well.[62] As such, caliper logs, cameras and casing inspection logs would *not* have been able to evaluate the integrity of the surface casing because due to the presence of the production casing.[63]

C. SoCalGas had a Sufficiently Reasonable Understanding the Location of the Groundwater and its Relationship to the Well for the Purposes of Safely Operating the Site.

SED alleges that "SoCalGas did not employ [a] reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25" until the two groundwater wells were drilled for RCA purposes.[64] However, such an understanding of groundwater depth is only relevant and necessary when initially drilling the well and SoCalGas had the information on groundwater necessary for the continued operation of the well.

Much of the SED testimony focuses on the surface casing in the SS-25 well. However, as discussed above in Section IV-A, there is no conclusive evidence that groundwater or corrosion created any holes in the surface casing. Additionally, both the Blade Report and the SED testimony present a figure which shows the groundwater entering the annulus of the 7-inch production casing and the wellbore below the depth of the surface casing.[65] Thus, the postulated mechanism by which the groundwater accessed the annulus of the 11 ¾ inch surface casing and the 7 inch production casing is via ingress below the surface casing shoe where the production casing is not cemented and then mixing with the fluids outside the production casing which extend upwards into the annulus between the production casing and the surface casing.

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administered the [1988] program, the corrosion issues on SS-25 would have been timely identified."). This is directly contradicted by the Blade Report which states "[i]t is not possible to determine what an inspection of the SS-25 casing would have shown in 1988." Blade Report at 205.

[62] As discussed in detail below in Section VII, this kind of workover requires a substantial amount of work and is dangerous.

[63] Notably, SED's witness testified that she had never dealt with inspection logs in a gas storage field and that she has never been present when an inspection log was run. *See* Felts Depo. Tr., 65:10-15 and 66:19-20.

[64] Blade Report at 39.

[65] *See* Blade Report at 100; SED Opening Testimony at 43.

This is important because, as acknowledged by Margaret Felts in her deposition, "[a]nybody who drills a well has to at least have a preliminary idea of where the groundwater is; so that starts because you case down to the bottom of the groundwater, fresh groundwater."[66] The SS-25 well was drilled in late 1953 and early 1954 by Tidewater Associated Oil Company. At the time that Tidewater drilled the well, they would have set the 11 ¾ inch surface casing at a depth reviewed and approved by the DOGGR, which was below all known shallow groundwater sources based upon local hydrogeology.[67]

The purpose of surface casing is to isolate freshwater strata so that they are not contaminated during the drilling and completion of a well. Surface casing is not designed to prevent oil and gas from escaping the well and getting to the surface. SoCalGas took over operation of the SS-25 well during the conversion of the Aliso Canyon field to gas storage. This is not uncommon. Of the approximately 400 gas storage fields in the U.S., roughly 80% are in depleted fields that originally were developed to produce oil and gas. Thus, conversion of older oil and gas wells is a common industry practice.

Given that the purpose of the surface casing is to protect groundwater zones during the initial drilling and completion of the well, which was done in 1953 and 1954, and that the oversight of the surface casing operation was reviewed and approved by the DOGGR, there really is no reason for SoCalGas to have a "reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25" as is alleged by in the SED testimony.[68]

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[66] Felts Depo. Tr., 251:17-20. However, Ms. Felts goes on to note that beyond that general statement, she does not know what practices at other gas storage facilities are (she does not know what industry standard is). Id. at 251:24-25.

[67] See Testimony of Dan Neville at 12 (noting that DOGGR set the presumed groundwater level at the time of drilling).

[68] Notably, in response to discovery questions relating to the laws, regulations and industry standards underlying this allegation, SED responded that "[g]ood completion practices include the use of drilling mud with an alkaline Ph [sic]; the circulation of cement for the entire length of the casing; use of similar metals in all parts of the structure; and the insulation of the well line from the casing." SED then cites to an alleged industry standard. However, as stated above, the knowledge of groundwater location is relevant to the initial drilling – this is where completion practices would come into play as well. Such practices are *irrelevant* to the ongoing operation of the well. *See* SED Supplemental Data Response to SoCalGas Data Request 3 (as supplemented Jan. 23, 2020), SED response to 9(b). Additionally, Blade noted that it did not identify any industry standards,

Once SoCalGas took over operation of the SS-25 well, there was no way for them to conduct an evaluation of the integrity of the surface casing. The surface casing was cemented in the wellbore. The production casing was inside of the surface casing and was also cemented. At the time of the conversion of the Aliso Canyon field to gas storage in the 1970's, and even in 2015 at the time of the SS-25 incident, the casing inspection logging tools used by the gas storage industry could only evaluate a single string of pipe. It was not possible to evaluate the integrity of the surface casing by running the logging tool down inside the production casing string.

Based on the historical data in the Aliso Canyon field, there was no reason for SoCalGas to anticipate there might be a potential problem with corrosion of the production casing at a depth above the surface casing shoe inside the annulus between the production casing and the surface casing, as occurred in the SS-25 well. Blade investigated the occurrences of shallow corrosion throughout the field. Regarding the 27 wells they identified that demonstrated shallow corrosion, Blade determined that almost all of the wells had production casing external corrosion present below the surface casing shoe. Excluding the SS-25, only one well, P-50A, had production casing external corrosion above the surface casing shoe.[69] Thus, corrosion on the production casing above the surface casing shoe was very rare.

SED's allegations that SoCalGas is at fault for failing to employ a reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of the SS-25 well are unsupported. Knowledge of the hydrogeology and groundwater is only relevant for the design and implementation of the surface casing.[70] This was done almost 20 years prior to SoCalGas taking over operations of the SS-25 well and was done with DOGGR approval. Moreover, DOGGR established the levels to assume for the base of freshwater at Aliso. There was no reason for SoCalGas to expect or anticipate possible corrosion of the production casing above the surface casing shoe because historically, prior to the SS-25 incident,

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laws or other regulations that required such an "understanding of groundwater depth" as demanded by SED. See Blade Response to SoCalGas Data Request, Jan. 9, 2020, Response to Questions 1b, 1c and 1d.

[69] Blade Report at 189.

[70] Ms. Felts appears to confirm this in her own testimony, where she agrees that "it would be necessary to have an understanding of groundwater depths for purposes of setting the surface casing." Felts Depo. Tr. 254:1-5. As stated above, the surface casing was set when the well was installed.

it had only happened once and was very rare. Further, the production casing in the well had been installed and cemented consistent with the industry standards of the U.S. gas storage industry at the time of installation.

D. Corrosion of the Surface Casing did not cause Corrosion in the Production Casing and the Surface Casing is not Intended as a Gas Barrier

SED argues that SoCalGas violated Section 451 because it did not "understand the consequences of corroded surface casings."[71] However, it is interesting to note that nowhere in their testimony does SED indicate what the consequences were of external corrosion of the surface casing in the SS-25 well.[72] In other words, SED faults SoCalGas for not understanding the consequences of corroded surface casing, yet they do not offer an explanation of what those consequences were.

Further, SED makes no mention in their testimony of any link or connection between corrosion of the surface casing in the SS-25 well and the rupture in the production casing of the well which caused the leak. As was stated in Section IV-A, *corrosion in the surface casing did not provide the ingress for groundwater to access the production casing at the point of the leak.*[73] Instead, this was caused by groundwater entering the wellbore opposite the uncemented production casing below the surface casing shoe. This is a completely different issue and will be discussed further below.

The Blade report also correctly points out that "[t]he function of the surface casing is to isolate fresh water sources and also provide a string for drilling the deeper hole for gas storage or oil production. The surface casing is not intended to provide any further barriers to gas or oil."[74] Thus, SoCalGas cannot be faulted for the condition of corrosion on the surface casing and any

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[71] Opening Testimony at 47.

[72] Further, SED's follow-up answers to discovery state the same – alleging serious consequences but merely stating that corrosion will occur. *See, e.g.*, SED Supplemental Data Response to SoCalGas Data Request 3 (as supplemented Jan. 23, 2020), SED response to question 9(a).

[73] Felts acknowledges this in her deposition, where she states that she does not contend that the corrosion of the surface casing was the point of entry for the water that caused corrosion at the SS-25 production casing. *See* Felts Depo. Tr. 241:10-17.

[74] Blade Report at 192.

escaping gas through holes in the surface casing, which were caused post-leak,[75] because the purpose and objective of surface casing is not to provide a barrier to gas or oil leaving the wellbore.

E. The Production Casing was Cemented Properly pursuant to Industry Standard Practices

SED alleges that SoCalGas violated Section 451 because it "did not understand the consequences of uncemented production casings."[76] Based on our experience, in the 1970's, when many of the Aliso Canyon wells were completed or converted for gas storage, it was not industry standard for underground gas storage wells to have the production casing cemented to surface. Rather, it was common practice that the production casing was cemented in a fashion such that the storage reservoir was isolated and cement extended above the storage zone for several hundred to a few thousand feet. This was the case in the SS-25 well where the top of cement was approximately 2,000 feet above the gas storage reservoir interval.

Of the 31 U.S. states with gas storage operations in October 2015, only six states had added requirements that production casings on existing, retrofitted wells be cemented to surface. California was not one of those states. In addition, it is not practical nor prudent to attempt to remediate a well by attempting to squeeze cement behind the production casing in those areas where the well was originally not cemented. The amount of damage caused to the casing would far outweigh any potential benefit of such remedial work.

With respect to the quality of the cement behind the surface casing, during the original well drilling operations in 1953 and 1954, attempts were made to cement the 11 ¾ - inch surface casing from 990 feet to the surface. However, during the cementing operations, no cement was returned to the surface indicating an incomplete cementing job. Thus, two top cement jobs were performed where cement is pumped from the surface down behind the surface casing to fill the annulus with cement up to the surface. This is a typical, industry standard operation when there are no surface returns, as was the case in the SS-25 well.

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[75] See Section X, infra.

[76] Id.

It is important to note that for most gas wells, the quality and completeness of cement behind the casing is unknown. The only indication that a surface casing cement job is satisfactory is whether or not cement is returned to surface. It is not customary, and it is considered unnecessary, to run a cement bond log on surface casing. Surface casings are not designed to be a barrier to oil and gas escaping the wellbore. Therefore, in cases such as this one where cement does not return to surface, it is industry standard practice to remediate the problem by augmenting the cementing procedure with one or more top cement jobs. This is exactly what was done in the drilling and completion of the SS-25 well.

Cementing of the production casing in gas storage wells to the surface was not industry standard. Rather, the industry standard and common practice was that the production casing was cemented in a fashion such that the storage reservoir was isolated and cement extended above the storage zone for several hundred to a few thousand feet. This was the case in the SS-25 well.

F. <u>Cathodic Protection is not Industry Standard and Was Not Necessary for SS-25.</u>

SED alleges that "[c]athodic protection systems are commonly used to protect pipelines from corrosion" and goes on to imply that SoCalGas is in violation of Section 451 for not employing cathodic protection on SS-25.[77] However, cathodic protection is not the industry standard for gas storage wells.

The gas storage industry remains divided as to the effectiveness of cathodic protection systems for storage wells. While it is recognized that there are certain localized conditions where such a system can be beneficial, for most gas storage we, the benefits of cathodic protection system are questionable. As a result, cathodic protection of surface casing in gas storage fields is not an industry standard practice.

The SED faults SoCalGas for not having installed cathodic protection to prevent corrosion of the surface casing in the SS-25 well. What the SED testimony does not mention; however, are the limitations and downsides of using cathodic protection in a gas storage field such as Aliso Canyon. Cathodic protection can be an effective tool to prevent corrosion in shallow surface

[77] Opening Testimony at 45-47.

casing strings. While not an industry standard, the technology is used in some gas storage fields with known areas of high corrosion. Recall that, Aliso Canyon is not one of these areas; the Blade report documented finding no pattern of corrosion associated with well age, well location, or depth. Thus, given that the SS-25 well is not in a corrosion "hot spot," the operator must balance the limited benefits of using cathodic protection to shield the surface casing versus the potential limitations and downsides.

In areas of high well density, such as the three-well pad at the SS-25 location where wells are located within a few hundred feet of one another, the application of cathodic protection is complex and problematic. If the induced currents are not properly balanced, well casings that are not receiving adequate current will be unprotected and through oxidation reactions will actually see increased corrosion and casing leaks, above what would have occurred with no cathodic protection. In these situations, corrosion of surface casings is actually increased rather than prevented.

Similarly, within the areal "footprint" of a cathodic protection system, all wells must be protected. The Aliso Canyon field is not only a gas storage field, but there are non-storage operations within the field boundaries accessing shallower hydrocarbon production. These shallow wells are not operated by SoCalGas. If SoCalGas were to install cathodic protection only on its gas storage wells, any shallow hydrocarbon wells operated by others at the field would suffer increased corrosion and loss of well integrity because of the cathodic protection currents.

Cathodic protection typically works very well on protecting surface pipelines or shallow gas gathering lines, where the resistivity of the environment around the steel is known and relatively uniform. However, in the case of vertical surface casing which extends to a depth of approximately 1,000 feet, such as the SS-25 well, the resistivity of the soils can change suddenly and dramatically with variations in depth. This results in an extremely difficult engineering solution to design a cathodic protection scheme that accounts for the rapid changes in soil resistivity and balances the current applied in the cathodic protection system. When multiple wells are added to the equation, such as would be the case around the SS-25 well pad, the problem becomes increasingly more difficult and complex. Any imbalance in the applied current

will have the undesired effect of increasing corrosion.

Finally, the axial rupture of the production casing occurred at a depth of 892 feet, which was inside the surface casing of the well. The Blade report clearly states, "While a cathodic protection system would have provided corrosion protection to the 11 ¾ in. casing, it would not have protected the 7 in. casing inside the 11 ¾ in. casing."[78] Thus, an independent corrosion protection mechanism like cathodic protection would not have been useful in this case, contrary to the suggestions made in the SED testimony.

V. SOCALGAS HAD WELLBORE INTEGRITY MANAGEMENT PROGRAM BEFORE THE INCIDENT THAT MET OR EXCEEDED INDUSTRY STANDARD PRACTICES

SED's Opening Testimony alleges, "SoCalGas did not have any form of risk assessment focused on wellbore integrity management, including lack of assessment of qualitative probability and consequence of production casing leaks or failures."[79] SED further criticizes SoCalGas for not initiating a storage integrity management program in 2009, even though such a program was recommended by Mr. James Mansdorfer, who was the Storage Engineering Manager at the time.[80] Lastly, SED faults SoCalGas for relying upon temperature and noise surveys for monitoring the casing integrity of gas storage wells at Aliso Canyon. Based on our review of the records and evidence, SED's assertions (which are the basis for asserted violations 74, 75 and 78) are unfounded.

First, prior to 2007 SoCalGas did assess risk as part of ongoing operations, even if it was not documented as a formal risk assessment program; this was consistent with the standard practices of other operators.[81] Second, starting in 2007 SoCalGas had a formal risk assessment program, which focused on wellbore integrity management. SoCalGas implemented a "Replace

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[78] Blade Report at 215.

[79] SED Opening Testimony at 12. Interestingly, SED testimony within Section 2 makes no further mention of this allegation.

[80] Note that SED's testifying expert, Margaret Felts, under oath, stated that she had never spoken or met Mr. James Mansdorfer. Felts Depo. Tr., 221:10-14. Instead, she relied on Mansdorfer's EUO and some produced documents from Mansdorfer or SoCalGs. Id. at 221:15-25.

[81] *See, e.g.*, Testimony of Phillip E. Baker, Southern California Gas Company, 2016 General Rate Case, A-14-11-004 at PEB-5 – PEB-8.

and Inspect" initiative, which included conducting wellbore integrity evaluations at Aliso Canyon and performing remedial work, if necessary, based on the results. SoCalGas implemented the initiative two years prior to Mr. Mansdorfer's 2009 recommendation for a similar initiative. The initiative included the inspection of the integrity of the production casing in the storage wells. Moreover, the "Replace and Inspect" initiative included detailed evaluations of the wellbore integrity and replacement of well hardware equipment, such as wellhead valves and the well tubing and packer. As a result of this initiative, SoCalGas permanently removed six wells of approximately 30 wells inspected from service based on their downhole condition.

Second, in 2014, SoCal Gas improved upon the "Replace and Inspect" initiative by developing the Storage Integrity Management Program ("SIMP"). SoCalGas was in the process of initiating the SIMP at the time of the SS-25 incident. For gas storage wells, SIMP includes threat identification and risk assessment based on a variety of factors, remediation as necessary, development of preventative and mitigative measures, and record-keeping requirements. Essentially, SIMP is combines risk management and integrity management into an aggressive integrity management program that addresses risk more proactively.[82]

The SIMP is consistent with the API RP 1171 recommended practice for well integrity evaluation. As explained above, API RP 1171 contemplates being implemented in 7-10 years and was not published until September 2015, shortly before the incident.[83] Moreover, SoCalGas' SIMP is similar to initiatives other gas storage operators were contemporaneously implemented. It is our experience that, historically, operators in the gas storage industry performed well integrity work responsively due to technological limitations as well as general success with the approach of remediating as issues arose. Recently, some operators are beginning to utilize improved technology to evaluate the condition of downhole equipment before failure occurs.[84]

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[82] For example, Ravi Krishnamurthy from Blade described SoCalGas' SIMP program as being "intense." Krisnamurthy Depo. Tr. 340:7-15.

[83] Underground Natural Gas Storage Integrity & Safe Operations 4 (July 6, 2016), available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/underground-natural-gas-storage/59336/aga-white-paper-ungs-integrity-and-safe-ops-20160706.pdf.

[84] For example, SoCalGas has already notified SED and others that part of its SIMP program involves the prioritization of wells. See SoCalGas Response to SED Request, Question 2, Received Feb. 4, 2016, Responded Feb. 16, 2016. (Providing a list of priority wells at Aliso Canyon).

While SoCalGas' efforts, the "Replace and Inspect" initiative and SIMP place them among the pioneers in the industry, moving towards a new, more proactive approach to well integrity management, they are really just formalizing risk assessment processes that were already in place, albeit informally.

Third, SED's criticisms are rooted in the benefits of hindsight. While SED faults SoCalGas for relying on temperature and noise surveys, it also acknowledges that DOGGR fully approved SoCalGas's case integrity monitoring program.[85] At the time of the SS-25 incident, only two states (out of 31 with gas storage operations) required corrosion testing through vertilog or similar casing inspection tools; of those two states, only one had significant gas storage operations. Further, only 10 of those 31 states required *any* periodic mechanical integrity testing on gas storage wells with tubing and packer completion.[86] While not controlling, because California was one of the states with requirements, this statistic is indicative of the progress in the industry. Therefore, SoCalGas was following DOGGR requirements and exceeding national standards by conducting annual temperature surveys on all Aliso Canyon storage wells.

VI. DUAL MECHANICAL BARRIERS ARE NOT INDUSTRY STANDARD AND SINGLE BARRIER WELL COMPLETIONS ARE INDUSTRY STANDARD.

In their Opening Testimony, SED asserts that SoCalGas did not have a dual mechanical barrier system in the wellbore of SS-25, instead leaving the 7-inch production casing as the primary barrier to the gas.[87] SED found "that SoCalGas violated Section 451 by operating well SS-25 without a backup mechanical barrier to the 7-inch production casing."[88]

While it is correct that SoCalGas did not have a dual mechanical barrier system in the wellbore of SS-25,[89] a dual barrier well design in underground gas storage has never, including

[85] DOGGR Project Approval Letter, April 18, 1989; revised July 26, 1989. SED acknowledges that DOGGR has primary jurisdiction over down hole gas storage and gas storage wells. Felts Depo. Tr., 235.

[86] California required periodic mechanical integrity testing and approved the use of temperature logs and noise logs, as needed to meet this requirement.

[87] SED Opening Testimony at 18.

[88] SED Opening Testimony at 25.

[89] At the time of conversion of the Aliso Canyon field to gas storage operations, the injection/withdrawal wells were designed with tubing on a packer and an installed subsurface safety valve ("SSSV"). The wells were operated in a single barrier configuration, utilizing annular flow to achieve the high flowrates necessary for storage operations. By flowing gas in the annulus between the tubing and production casing, effectively only a single

through today, been considered the industry standard practice.[90] In its opening testimony, SED fails to identify an industry standard requiring a dual mechanical barrier system. As stated by a JITF report, *Underground Natural Gas Storage – Integrity & Safe Operations* ("JITF Report"), "Operators have designed and installed a number of different well completions depending on their historical experiences, practices, and site-specific conditions. A common well completion case referenced herein contains production casing without tubing."[91] The JITF Report goes on to state that "10-25 percent of natural gas storage wells have a full tubing string set into an isolation packer."[92] JITF later revised this figure to 13 percent of natural gas storage wells.[93] Thus, Aliso Canyon's single barrier well completion were consistent with the industry standard and approximately 87% of all gas storage wells in operation in the U.S.[94]

VII. SOCALGAS' PROGRAM FOR THE INSPECTION AND MEASUREMENT OF WALL THICKNESS WAS COMPLIANT WITH REGULATIONS AND MET INDUSTRY STANDARDS.

SED asserts, in connection with violation 78 that, "SoCalGas did not have internal policies that required inspection and measurement of the wall thickness of wellbores at Aliso. Instead, SoCalGas used techniques that detected and fixed leaks only after the event occurred."[95] SED testimony also notes, "SoCalGas had no internal policies on wall thickness inspections because the company assumed that regulatory compliance was being adhered to by running

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barrier, the production casing, existed between the storage gas and the surrounding strata in those parts of the well where the production casing was not cemented.

[90] It is important to note that DOGGR's regulations requiring dual mechanical barriers (Cal. Code Reg. § 1726.5(b)(1)) are only mandated to be in place "within seven years" of the effective date of the regulations, which is not until October 2025. Cal. Code Reg. § 1726.3(d)(1). Additionally, Margaret Felts, SED's testifying witness, stated that she did not "know what technology is used in the wells in other storage fields around the United States" and that she had not "looked into that." Felts Depo. Tr., 236-37:23-1.

[91] Underground Natural Gas Storage Integrity & Safe Operations 21 (July 6, 2016), available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/underground-natural-gas-storage/59336/aga-white-paper-ungs-integrity-and-safe-ops-20160706.pdf

[92] Id. at 55.

[93] Note the range was updated by JITF in September 2016 according to a poll of U.S. Underground Natural Gas Storage Operators "Tubing and Packers in Underground Natural Gas Storage: Safety and Reliability Considerations", AGA/API/INGAA Underground Natural Gas Storage Joint Industry Task Force, September 16, 2016, Slide 13. This estimate represents an 80% response rate (13,485 out of a total of 17,500 storage wells). Id.

[94] Id.

[95] SED Opening Testimony at 25.

annual temperature surveys in accordance with the Aliso Canyon Monitoring Plan and the project approval letter dated 1989 requiring an annual mechanical integrity test (MIT)."[96]

First, SED is incorrect that SoCalGas "assumed that regulatory compliance was being adhered to through the running of annual temperature surveys." DOGGR approved SoCalGas's monitoring program as being in regulatory compliance.[97] Further, as already noted, the SoCalGas monitoring program met and exceeded industry standards.[98]

Second, SED's testimony creates the inference that SoCalGas could have, and should have, done better than simply running temperature surveys and periodic noise logs. The SED testimony faults SoCalGas for not also running casing inspection logs. However, SED criticism directed at SoCalGas's policies and practices is myopic and ignores the lessons learned by the gas storage industry over the past 60+ years.

Running a casing inspection log in a well, such as the SS-25 well at Aliso Canyon, necessarily requires conducting a workover on the wellA workover entails killing the gas production from the well by filling the wellbore with fluid and then pulling all of the tubing out of the wellbore. Only after all this is done may a gas storage operator run a casing inspection log in the well. It was not possible to evaluate the integrity of the production casing by running the logging tool down the tubing string. Therefore, to accomplish what the SED testimony suggests should have been done, which is to run casing inspection logs in wellbores that had historically given no indication of problems with the production casing, it would have been necessary to run a workover on the well.

The JITF Report contains a detailed discussion of the risks of workovers in Section 2 of their document titled, "Lessons Learned from Historical Underground Natural Gas Reservoir

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[96] SED Opening Testimony at 25-26.

[97] *See* Blade Report at 216 ("The 2015 DOGGR regulations required periodic MITs, and annual temperature surveys were approved to meet the MIT requirements."). *See also* id. at 202 (noting that DOGGR "approved the use of static temperature surveys to satisfy compliance of the requirements for mechanical integrity."

[98] Moreover, Blade has stated that it did not identify any industry standards "in connection with internal policies requiring production casing wall thickness inspections." Blade Response to the SoCalGas Data Request January 23, 2020 (Feb. 14, 2020) at 6.

Storage Well Events (API 1171 Sections 8.4 and 8.7)."[99] The JITF Report analyzed 61 unplanned storage well releases of gas in the U.S. between 1953 and 2010.[100] Their analysis showed that approximately a third of the 61 incidents on record happened during well interventions, including well workovers or re-works. The JITF Report further notes that the industry statistics show the likelihood of such an unplanned release event occurring in a gas storage well is classified as "very unlikely" to "extremely unlikely" or "remote". Thus, it is significant that approximately a third of such incidents occurred during well workovers.

For example, three workers recently died (and a fourth was injured) during a workover operation at a well in Burleson County, TX.[101] The investigation is ongoing but it is believed that an "unexpected amount of natural gas entered the well and ignited. What caused the ignition remains under investigation."[102] A similar incident occurred in Watford City, North Dakota in 2016, where one worker was killed and three seriously injured when an amount of gas entered the well during a workover and ignited.[103] A 2017 report by the Centers for Disease Control and Prevention and the National Institute for Occupational Safety and Health found that 9 fatalities occurred in 2014 during well workovers and that "rig or equipment repair and maintenance" was

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[99] Underground Natural Gas Storage Integrity & Safe Operations 21 (July 6, 2016), available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/underground-natural-gas-storage/59336/aga-white-paper-ungs-integrity-and-safe-ops-20160706.pdf.

[100] Underground Natural Gas Storage Integrity & Safe Operations 10 (July 6, 2016), available at https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/technical-resources/pipeline/underground-natural-gas-storage/59336/aga-white-paper-ungs-integrity-and-safe-ops-20160706.pdf.

[101] *See* Liz Hampton, *Chesapeake Energy, others sued for $1 million in fatal Texas oil-well blast*, REUTERS U.S. LEGAL NEWS (Feb. 2, 2020), available at https://www.reuters.com/article/us-chesapeake-enrgy-blowout-lawsuit/chesapeake-energy-others-sued-for-1-million-in-fatal-texas-oil-well-blast-idUSKBN1ZZ2P1 (noting that the blowout occurred during a workover operation); *see also* Jerry Bohnen, *Federal agencies probe Chesapeake well blowout that killed 3 workers in Texas*, OK ENERGY TODAY (Feb. 5, 2020), available at http://www.okenergytoday.com/2020/02/federal-agencies-probe-chesapeake-well-blowout-that-killed-3-workers-in-texas/ (noting the death of the third worker).

[102] *Feds to Probe Fatal Chesapeake Energy Oil Well Accident*, ROUGHNECK NEWS (Feb. 4, 2020), available at https://www.roughneckcity.com/roughneck-city/oilfieldnews/1415/feds-to-probe-fatal-chesapeake-energy-oil-well-accident.

[103] Amy Dalrymple, One Killed, Three Injured in Well Site Accident, Williston Herald (June 20, 2016), available at https://www.willistonherald.com/news/one-killed-three-injured-in-well-site-accident/article_e90d2b4c-3713-11e6-98b4-0fe09945798a.html.

one of the activities "most commonly associated with fatalities."[104]

U.S. gas industry experience mirrors the JITF Report's findings that *the most likely time to have an accident or an incident on a well is during a workover*. Anytime a gas storage operator pulls a pipe out of a well, such as when removing tubing to run a casing inspection log, the chance of an incident increases dramatically.

In their 2016 presentation, the JITF noted the following safety risks and dangers of running casing inspection logs in a gas storage well:

- Advanced tools such as high resolution Vertilog cannot be used to analyze the condition of the casing when tubing is present. Thus, a workover is required.
- The greatest risk for an accident is during intervention or workover.
- Packer slips apply thousands of pounds of force into the casing and leave indentations in the pipe wall. Thus, unseating the packer in order to remove the tubing during a workover can cause scale and ovality, which allows gas to leak around the packer.[105]

Therefore, there is a very good reason why the gas storage industry standard for monitoring casing integrity, in wells with tubing and packer completion, at the time of the SS-25 incident was to use temperature surveys rather than the more aggressive strategy of conducting well workovers so that casing integrity logs could be run.[106] Given the safety risks associated with well workovers JITF identified, it is often not the best course of action for a gas storage operator to run a workover on their well when there is no reason to suspect there might be a problem with that well, as was the case with SS-25. To do so only increases the risk and likelihood of an unplanned release of storage gas.

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[104] SOPHIA RIDL ET AL., CENTERS FOR DISEASE CONTROL AND PREVENTION & NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH, OIL AND GAS EXTRACTION WORKER FATALITIES 2014 12-14 (Aug. 2017).

[105] "Tubing and Packers in Underground Natural Gas Storage: Safety and Reliability Considerations", AGA/API/INGAA Underground Natural Gas Storage Joint Industry Task Force, September 16, 2016, Slide 6.

[106] It is also important to note that SED's sole witness, Margaret Felts stated that she had "never been present when a log was run on an oil or gas well." Felts Depo. Tr., 66:19-20.

VIII. SOCALGAS' PRESSURE MONITORING SYSTEM WAS REASONABLE AND THE CHANGES SED DEMANDS WOULD NOT HAVE MADE ANY DIFFERENCE.

SED asserts, in connection with violation 87 that "SoCalGas lacked a real-time, continuous pressure monitoring system for well surveillance, which prevented an immediate identification of the SS-25 leak and accurate estimation of the gas flow rate."[107]

SED's testimony regarding real time pressure monitoring ("RTPM") is unclear. At deposition, SED's witness clarified that the reason RTPM was important was that it could have enabled SoCalGas to identify and remediate the leak at SS-25, which she believes had been present for years, at an earlier point in time.[108] The facts, however, are otherwise: the leak and failure at SS-25 was a sudden event and there was no pre-existing leak. Ms. Felts testimony on this issue is also inconsistent with Blade's report. As such, SED's contention here is simply without any factual basis or support.

Ms. Felts also appears to be arguing separately that RTPM would have provided flow rate data that could have been utilized in the well kill.[109] As a general matter, SED's allegations regarding real time pressure monitoring, and the Blade analysis on which it appears to be based, are highly speculative.

A. Real-Time Pressure Monitoring Systems Are Not Industry Standard in Gas Storage Fields.

A real-time continuous pressure monitoring system, as discussed in the SED testimony, is also known as Supervisory Control and Data Acquisition, or SCADA. The SED testimony in this section is critical of SoCalGas for not having a SCADA system in place at Aliso Canyon at the time of the SS-25 incident. However, installing SCADA on existing gas storage wells was not an industry standard practice in the U.S. gas storage industry in October 2015. Notably, both Blade and SED's expert witness stated that they did not identify any industry standards or regulations that required real-time, continuous pressure monitoring for well operations.[110]

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[107] SED Opening Testimony at 47.

[108] See Felts Depo. Tr. 267:15-25, 268:8-16, 269:22-24.

[109] *See, e.g.*, Felts Depo. Tr. 270:15-272:1.

[110] SED's expert testified that she was unaware of and had not looked into industry standard practice regarding continuous pressure monitoring in gas storage fields. Felts Depo. Tr. 266:1-5. *See also* Blade Response to

Without a communication link to each wellhead, there was virtually no opportunity for remote control, much less data monitoring. The Interagency Task Force on Natural Gas Storage Safety notes that 80% of all storage wells within the industry were drilled prior to 1980 and thus did not have a communication link.[111] Thus, in order to have remote control or data monitoring, storage operators would have to retrofit old wellheads with expensive electronic data recorders. It wasn't until gas storage compressor stations became more automated and had fully functional computer networks and SCADA systems, that operators began to extend communications capabilities to individual wells. It wasn't until the early 2000's that remote data capture equipment started to be installed on wellheads so the operators could download pressure and temperature data periodically, typically weekly, to their laptops. Our experience indicates that even today less than half of all gas storage operators have full SCADA capability. New regulations issued after the SS-25 incident will likely accelerate installations, but they have been slow coming.[112]

Most gas storage operators now have SCADA systems for their compressor station(s) and central control facility operation, but as of 2015 very few gas storage fields that were developed in depleted oil or gas fields had retrofitted their storage wells with this capability.[113] SoCalGas was in this same position at Aliso Canyon having a SCADA system for their central facilities, but not for monitoring individual well data. At the time of the SS-25 incident, SoCalGas had purchased and was in the process of installing SCADA for their wells at each of their gas storage facilities, but the system at Aliso Canyon had not yet been installed.

SoCalGas Data Request, Feb. 14, 2020, Response to Questions 2a and 2b (pp. 7-8) (Blade states that it "did not identify any INDUSTRY STANDARD(S) 'related to real-time, continuous pressure monitoring systems for well surveillance.'" Blade similarly did not identify any laws or regulations requiring real-time, continuous pressure monitoring).

[111] Ensuring Safe and Reliable Underground Natural Gas Storage – Final Report of the Interagency Task Force on Natural Gas Storage Safety, October 2016

[112] See https://inductiveautomation.com/resources/article/what-is-scada.

[113] Notably, SED's witness testified that she had not looked at industry standards for continuous pressure monitoring in gas storage operations *at all*. *See* Felts Depo. Tr. At 266:1-5.

B. Real-Time Pressure Monitoring would neither have Provided a Meaningfully More immediate Ddentification of the Leak nor would it have Provided Insight into the Extent of the Leak.

The SED testimony states the following:

"The lack of real-time pressure measurements prevented the immediate identification of the SS-25 7-inch casing failure."[114] SED further states that "[i]f this type of system had been installed on SS-25, it would have provided insight into the time of the leak, the opportunity to shut in the well immediately, size of the leak, and the extent of the problem."[115]

The above SED statements, which are copied directly from the Blade report with no further comment, analysis or insights, are incorrect and irrelevant. SED alleges that if a SCADA system were installed, it would have provided insight into the time of the leak and the opportunity to shut-in the well immediately.[116] That SoCalGas could have somehow stopped the failure mid-rupture is pure speculation, lacks factual support, and belies credulity.[117] Blade estimates the time of the leak at between 7am and 8am on October 23, 2015.[118] SoCalGas discovered the leak at 3:15pm that same day, and shut-in the well by 3:30pm that same day. For all intents and purposes, SoCalGas, through their regular well monitoring, discovered the leak and shut-in the well almost immediately. A few hours difference in the initial identification of the gas leak and the closing of the well would have made absolutely no difference to the actions and outcome at the SS-25 well.

SED further alleges that if a SCADA system were installed, it would have provided insight into the size of the leak. Presumably, by the "size of the leak", SED (and Blade) mean the gas flow rate of the leak. But this is impossible. A SCADA system would have provided no

[114] SED Opening Testimony at 48.

[115] Id.

[116] SED's witness says the same in her deposition, where she stated that "[SoCalGas] would be able to see exactly what was going on in the well and because they didn't have that, they were somewhat hampered in being able to detect the leak before it actually broke out the surface . . ." Felts Depo. Tr. 267:15-21. However, she appears to be relying solely on the Blade Report when giving this testimony. *See* Id. at 266:24 – 267:2.

[117] SED's expert appears to believe that continuous monitoring would have allowed SoCalGas to identify the leak at an earlier stage when it was a "smaller leak," which would have made dealing with it easier. Felts Depo. Tr. 268:21 – 267:1; *see also* id. at 271:19 – 272:1. There is no evidence to support this, especially given how rapidly Blade explained the crack in the casing propagating. *See* Blade Report at 52.

[118] Blade Report at 158.

information at all as to the magnitude of the gas leak. A SCADA system measures surface tubing and casing pressures and, if equipped with a well flow meter, the injection or production rate at the wellhead. At the time of the leak, the SS-25 well was injecting gas at a rate of approximately 70 MMscf per day. That is the rate that the SCADA system would have measured, and that rate has absolutely nothing to do with the magnitude of the downhole gas leak. Once the well was shut-in, the gas injection rate would now be zero, but the SCADA system would still not be measuring any flow rate associated with the gas leak because the SCADA system measures data at the wellhead. As the Blade report states, most of the gas from the leak would have "flowed through the heavily weathered and vertically fractured top 200-300 ft. of formation, however, some would have flowed horizontally through permeable or fractured layers away from the SS-25 well site, and some would have remained in the subsurface." It is not possible for a real-time measurement system at the to wellhead detect and measure the gas flow rate outside the wellhead flowing through the geologic strata.

Finally, SED alleges that if a SCADA system were installed, it would have provided insight into the extent of the problem. Once again, this could not be possible. Real-time measurement of surface tubing and casing pressures, as well as gas injection rates, would have yielded no information whatsoever as to the location of the leak in the production casing, the type or size of the rupture in the casing, or as was stated earlier the magnitude of the gas flow rate. SCADA would have yielded no information at all as to the extent of the "problem".

The SED allegations in respect of SCADA are unfounded. SCADA on individual wells was not an industry standard in 2015 in gas storage fields developed in depleted oil and gas fields (80% of the U.S. gas storage fields). SCADA would not have yielded any useful information as to the location or extent of the gas leak in the SS-25 well. And, most importantly, a SCADA system would have made absolutely no difference in the events that transpired at the SS-25 well on October 23, 2015 and thereafter.

IX. SOCALGAS HAD ORANIZED WELL FILES THAT CONTAINED THE APPROPRIATE AND NECESSARY INFORMATION.

In support of violations 327-329, SED asserts that "SoCalGas did not keep complete,

accurate, or accessible records that were necessary for the safe operation and maintenance of its wells at Aliso Canyon Natural Gas Storage Facility." [119]

The SED allegation is incorrect. We note that there are no regulations or documented industry standards prescribing what sorts of documents should go into a well file or how they should be organized. Based on our experience at numerous gas storage fields and with gas storage operators, we believe that the Aliso Canyon well files are in fact well organized and contain the appropriate and necessary information. Each well has four separate files; one for the drilling programs, wellbore schematic, rework history and permits; a second file for downhole logs; a third file for well surveys that includes subsurface pressure data and temperature surveys; and a fourth file for wireline invoices. As noted by SED, they do not include data related to operations or maintenance of related and supporting facilities, which is consistent within the industry. These data would normally be kept in separate files appropriate for that purpose. For example, the Maximo system stores maintenance data related to storage facilities such as wellhead valves, leakage surveys, etc.

We have reviewed many of the well files for the Aliso Canyon gas storage field and, based on our experience, it is our opinion that these records were maintained in a manner exceeding the industry standard for U.S. gas storage operating companies.[120] SED's testimony, provided by Ms. Margaret Felts, indicates that she never reviewed the actual physical Aliso Canyon well files.[121] Ms. Felts acknowledges that she only reviewed an electronic production of records from SoCalGas' well files in response to a data request, not a physical well file.[122] Therefore, we believe that without properly reviewing the actual well files, SED cannot

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[119] SED Opening Testimony at 67.

[120] Notably, SED does not state what it believes industry standards for record organization are. In response to questions about what record *retention* policies it believes were relevant to the industry, SED provided a record retention policy from PG&E. *See* SED Supplemental Data Response to SoCalGas Data Request 3 (as supplemented Jan. 23, 2020), SED response to question 25(a). However, this PG&E policy ("PG&E.P2-2-Guide.to.Record.Retention-2003") did not provide any standards or practices for record organization and is therefore irrelevant.

[121] Felts Depo. Tr. 135:22 – 136:1. Further, Ms. Felts testified that she has never looked at recordkeeping practices at other gas storage fields. Id. at 312:14-19.

[122] Felts Depo. Tr. 135:22 – 136:1.

appreciate the accuracy or completeness of the SoCalGas well files at Aliso Canyon.

X. CONCLUSION.

This concludes our testimony.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-48 DATED DECEMBER 4, 2019

SOCALGAS RESPONSE DATED DECEMBER 19, 2019

SoCalGas provides the following Responses to the Safety Enforcement Division (SED) data request dated December 4, 2019 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

Please refer to SoCalGas Opening testimony of Mr. Dan Neville in I.19-06-016, page 3 line 27 to page 4 line 1, which states, "To evaluate the integrity of the casing body and connections, SoCalGas performed a pressure test to 3400 pounds per square inch (psi), above the maximum operating pressure of 3150 psi." With this statement in mind, please answer the following:

a. To what period of time is this statement referring?
b. By SED's calculations, the test shown above is approximately 1.08 times the

maximum operating pressure. Please confirm this is accurate. If SoCalGas disagrees with this, please provide the factor of the test above the maximum operating pressure.

c. On what date did SoCalGas pressure test the casing body and connections of well SS25 to 3400 psi?

d. Please provide the complete pressure test record showing the pressure test, including the date and psi.

e. Did SoCalGas ever exceed the stated maximum operating pressure on well SS-25?

f. If the answer to question 1h is yes, please answer:
   1. How many times?
   2. The dates and times of such times.
   3. The pressure and length of each time at which well SS-25 was operated above 3150 psi.
   4. The reason well SS-25 was operated above 3150 psi.

RESPONSE 1:

a. The pressure test occurred on May 29, 1973 during the workover to convert the well to gas storage.

b. SoCalGas objects to this request to the extent it does not seek information or documents but rather seeks to have SoCalGas confirm a mathematical calculation. SoCalGas further objects to the extent the request assumes the maximum operating pressure was applicable on May 29,1973. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The maximum operating pressure of 3150 psi was established in 2016. SoCalGas confirms the test is about 1.08 times this maximum operating pressure.

c. May 29, 1973.

d. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "complete pressure test record." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to the following electronic documents previously provided to CPUC-SED that include the SS-25 well file documents and/or well related information with Bates ranges:

   AC_CPUC_0000023 - AC_CPUC_0000759

AC_CPUC_0012338 - AC_CPUC_0012389
AC_CPUC_0206158 - AC_CPUC_0208846.

e. SoCalGas objects to this request as overly broad and unduly burdensome, and to the extent the request assumes the maximum operating pressure was applicable on or before October 23, 2015. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek information on or before October 23, 2015. Please see previously provided electronic documents with Bates Ranges:

AC_CPUC_0009479; AC_CPUC_0009485; AC_CPUC_0009492; AC_CPUC_0009498; AC_CPUC_0009504; AC_CPUC_0009510; AC_CPUC_0009516; AC_CPUC_0009522; AC_CPUC_0009528; AC_CPUC_0009540; AC_CPUC_0009546; AC_CPUC_0009552; AC_CPUC_0009558; AC_CPUC_0009564; AC_CPUC_0009570; AC_CPUC_0009576; AC_CPUC_0009582; AC_CPUC_0009588; AC_CPUC_0009594; AC_CPUC_0009600; AC_CPUC_0009606; AC_CPUC_0009612; AC_CPUC_0009618; AC_CPUC_0009624; AC_CPUC_0009630; AC_CPUC_0009679; AC_CPUC_0009680; AC_CPUC_0009683; AC_CPUC_0009687; AC_CPUC_0009688; AC_CPUC_0009691; AC_CPUC_0009695; AC_CPUC_0009696; AC_CPUC_0009700; AC_CPUC_0009704; AC_CPUC_0009708; AC_CPUC_0009712; AC_CPUC_0009713; AC_CPUC_0009716; AC_CPUC_0009717; AC_CPUC_0009720 ; AC_CPUC_0009724; AC_CPUC_0009728; AC_CPUC_0009729; AC_CPUC_0009732; AC_CPUC_0009736 ; AC_CPUC_0009737; AC_CPUC_0009740; AC_CPUC_0009744; AC_CPUC_0009748; AC_CPUC_0009749 ; AC_CPUC_0009752; AC_CPUC_0009753; AC_CPUC_0009756; AC_CPUC_0009757; AC_CPUC_0009762; AC_CPUC_0009766; AC_CPUC_0009767; AC_CPUC_0009769 ; AC_CPUC_0009771; AC_CPUC_0009772 ; AC_CPUC_0009775; AC_CPUC_0009776; AC_CPUC_0009779; AC_CPUC_0009780; AC_CPUC_0009783; AC_CPUC_0009787; AC_CPUC_0009788; AC_CPUC_0009791 ; AC_CPUC_0009793; AC_CPUC_0009794 ; AC_CPUC_0009798; AC_CPUC_0009799; AC_CPUC_0009802; AC_CPUC_0009803; AC_CPUC_0009806; AC_CPUC_0009807; AC_CPUC_0009810; AC_CPUC_0009811; AC_CPUC_0009814; AC_CPUC_0009815; AC_CPUC_0009818; AC_CPUC_0009822; AC_CPUC_0009823; AC_CPUC_0009826; AC_CPUC_0009830; AC_CPUC_0009831; AC_CPUC_0009835; AC_CPUC_0009837; AC_CPUC_0009838; AC_CPUC_0009841; AC_CPUC_0009844; AC_CPUC_0009845; AC_CPUC_0009848; AC_CPUC_0009850;

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

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AC_CPUC_0009852; AC_CPUC_0009854; AC_CPUC_0009856; AC_CPUC_0009858; AC_CPUC_0009860; AC_CPUC_0009862; AC_CPUC_0009864; AC_CPUC_0009866; AC_CPUC_0009868; AC_CPUC_0009870; AC_CPUC_0009872; AC_CPUC_0009874; AC_CPUC_0009876; AC_CPUC_0009878; AC_CPUC_0009880; AC_CPUC_0009882; AC_CPUC_0009884; AC_CPUC_0009886; AC_CPUC_0009888; AC_CPUC_0009890; AC_CPUC_0009892; AC_CPUC_0009894; AC_CPUC_0009896; AC_CPUC_0009898; AC_CPUC_0009900; AC_CPUC_0009902; AC_CPUC_0009904; AC_CPUC_0009906; AC_CPUC_0009908; AC_CPUC_0009910; AC_CPUC_0009912; AC_CPUC_0009914; AC_CPUC_0009916; AC_CPUC_0009918; AC_CPUC_0009920; AC_CPUC_0009922; AC_CPUC_0009924; AC_CPUC_0009926; AC_CPUC_0009928; AC_CPUC_0009930; AC_CPUC_0009932; AC_CPUC_0009936; AC_CPUC_0009938; AC_CPUC_0009940; AC_CPUC_0009942; AC_CPUC_0009944; AC_CPUC_0009946; AC_CPUC_0009948; AC_CPUC_0009950; AC_CPUC_0009952; AC_CPUC_0009954; AC_CPUC_0009956; AC_CPUC_0009958; AC_CPUC_0009960; AC_CPUC_0009962; AC_CPUC_0009964; AC_CPUC_0009966; AC_CPUC_0009968; AC_CPUC_0009970; AC_CPUC_0009972; AC_CPUC_0009974; AC_CPUC_0009976; AC_CPUC_0009978; AC_CPUC_0009980; AC_CPUC_0009982; AC_CPUC_0009984; AC_CPUC_0009986; AC_CPUC_0009988; AC_CPUC_0009990; AC_CPUC_0009992; AC_CPUC_0009994; AC_CPUC_0009996; AC_CPUC_0009998; AC_CPUC_0010000; AC_CPUC_0010002; AC_CPUC_0010004; AC_CPUC_0010006; AC_CPUC_0010008; AC_CPUC_0010010; AC_CPUC_0010012; AC_CPUC_0010014; AC_CPUC_0010016; AC_CPUC_0010018; AC_CPUC_0010020; AC_CPUC_0010022; AC_CPUC_0010026; AC_CPUC_0010028; AC_CPUC_0010030; AC_CPUC_0010032; AC_CPUC_0010034; AC_CPUC_0010036; AC_CPUC_0010038; AC_CPUC_0010040; AC_CPUC_0010042; AC_CPUC_0010044; AC_CPUC_0010045; AC_CPUC_0010048; AC_CPUC_0010052; AC_CPUC_0010054; AC_CPUC_0010056; AC_CPUC_0010058; AC_CPUC_0010060; AC_CPUC_0010074; AC_CPUC_0010078; AC_CPUC_0010079; AC_CPUC_0010084; AC_CPUC_0010091; AC_CPUC_0010096; AC_CPUC_0010097; AC_CPUC_0010108; AC_CPUC_0010109; AC_CPUC_0010114; AC_CPUC_0010115; AC_CPUC_0010126; AC_CPUC_0010127; AC_CPUC_0010131; AC_CPUC_0010136; AC_CPUC_0010137; AC_CPUC_0010143; AC_CPUC_0010144; AC_CPUC_0010157; AC_CPUC_0010167; AC_CPUC_0010175; AC_CPUC_0010176; AC_CPUC_0010177; AC_CPUC_0010186; AC_CPUC_0010187; AC_CPUC_0010188; AC_CPUC_0010196; AC_CPUC_0010197; AC_CPUC_0010208; AC_CPUC_0010209; AC_CPUC_0010211; AC_CPUC_0010218; AC_CPUC_0010221; AC_CPUC_0010222; AC_CPUC_0010223; AC_CPUC_0010228; AC_CPUC_0010229; AC_CPUC_0010232; AC_CPUC_0010233; AC_CPUC_0010248; AC_CPUC_0010249; AC_CPUC_0010252; AC_CPUC_0010261; AC_CPUC_0010262; AC_CPUC_0010270; AC_CPUC_0010271;

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

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AC_CPUC_0010277; AC_CPUC_0010288; AC_CPUC_0010289; AC_CPUC_0010291; AC_CPUC_0010296; AC_CPUC_0010297; AC_CPUC_0010300; AC_CPUC_0010301; AC_CPUC_0010310; AC_CPUC_0010312; AC_CPUC_0010319; AC_CPUC_0010320; AC_CPUC_0010323; AC_CPUC_0010329; AC_CPUC_0010342; AC_CPUC_0010343; AC_CPUC_0010347; AC_CPUC_0010350; AC_CPUC_0010351; AC_CPUC_0010357; AC_CPUC_0010370; AC_CPUC_0010371; AC_CPUC_0010377; AC_CPUC_0010384; AC_CPUC_0010385; AC_CPUC_0010397; AC_CPUC_0010406; AC_CPUC_0010413; AC_CPUC_0010414; AC_CPUC_0010415; AC_CPUC_0010423; AC_CPUC_0010424; AC_CPUC_0010429; AC_CPUC_0010430; AC_CPUC_0010437; AC_CPUC_0010445; AC_CPUC_0010448; AC_CPUC_0010455; AC_CPUC_0010456; AC_CPUC_0010461; AC_CPUC_0010470; AC_CPUC_0010473; AC_CPUC_0010483; AC_CPUC_0010484; AC_CPUC_0010488; AC_CPUC_0010511; AC_CPUC_0010515; AC_CPUC_0010527; AC_CPUC_0010528; AC_CPUC_0010532; AC_CPUC_0010537; AC_CPUC_0010540; AC_CPUC_0010547; AC_CPUC_0010555; AC_CPUC_0010557; AC_CPUC_0010558; AC_CPUC_0010561; AC_CPUC_0010563; AC_CPUC_0010572; AC_CPUC_0010576; AC_CPUC_0010586; AC_CPUC_0010599; AC_CPUC_0010613; AC_CPUC_0010617; AC_CPUC_0010621; AC_CPUC_0010631; AC_CPUC_0010638; AC_CPUC_0010641; AC_CPUC_0010648; AC_CPUC_0010649; AC_CPUC_0010655; AC_CPUC_0010658; AC_CPUC_0010659; AC_CPUC_0010660; AC_CPUC_0010680; AC_CPUC_0010690; AC_CPUC_0010691; AC_CPUC_0010700; AC_CPUC_0010705; AC_CPUC_0010711; AC_CPUC_0010715; AC_CPUC_0010716; AC_CPUC_0010719; AC_CPUC_0010721; AC_CPUC_0010727; AC_CPUC_0010743; AC_CPUC_0010754; AC_CPUC_0010756; AC_CPUC_0010764; AC_CPUC_0010765; AC_CPUC_0010769; AC_CPUC_0010770; AC_CPUC_0010778; AC_CPUC_0010779; AC_CPUC_0010786; AC_CPUC_0010787; AC_CPUC_0010793; AC_CPUC_0010799; AC_CPUC_0010813; AC_CPUC_0010842; AC_CPUC_0010848; AC_CPUC_0010849; AC_CPUC_0010857; AC_CPUC_0010863; AC_CPUC_0010865; AC_CPUC_0010874; AC_CPUC_0010875; AC_CPUC_0010882; AC_CPUC_0010887; AC_CPUC_0010888; AC_CPUC_0010897; AC_CPUC_0010908; AC_CPUC_0010919; AC_CPUC_0010924; AC_CPUC_0010926; AC_CPUC_0010929; AC_CPUC_0010935; AC_CPUC_0010941; AC_CPUC_0010948; AC_CPUC_0010950; AC_CPUC_0010957; AC_CPUC_0010961; AC_CPUC_0010965; AC_CPUC_0010981; AC_CPUC_0010989; AC_CPUC_0010994; AC_CPUC_0010996; AC_CPUC_0011014; AC_CPUC_0011019; AC_CPUC_0011029; AC_CPUC_0011033; AC_CPUC_0011041; AC_CPUC_0011050; AC_CPUC_0011054; AC_CPUC_0011062; AC_CPUC_0011077; AC_CPUC_0011090; AC_CPUC_0011125; AC_CPUC_0011140; AC_CPUC_0011148; AC_CPUC_0011150; AC_CPUC_0011164; AC_CPUC_0011169; AC_CPUC_0011170; AC_CPUC_0011173; AC_CPUC_0011176; AC_CPUC_0011179; AC_CPUC_0011182;

AC_CPUC_0011185; AC_CPUC_0011188; AC_CPUC_0011191; AC_CPUC_0011194; AC_CPUC_0011197; AC_CPUC_0011200; AC_CPUC_0011203; AC_CPUC_0011206; AC_CPUC_0011209; AC_CPUC_0011212; AC_CPUC_0011215; AC_CPUC_0011218; AC_CPUC_0011221; AC_CPUC_0011224; AC_CPUC_0011227; AC_CPUC_0011230; AC_CPUC_0011233; AC_CPUC_0011236; AC_CPUC_0011239; AC_CPUC_0011242; AC_CPUC_0011245; AC_CPUC_0011248; AC_CPUC_0011251; AC_CPUC_0011254; AC_CPUC_0011257; AC_CPUC_0011260; AC_CPUC_0011263; AC_CPUC_0011266; AC_CPUC_0011269; AC_CPUC_0011272; AC_CPUC_0011275; AC_CPUC_0011278; AC_CPUC_0011281; AC_CPUC_0011284; AC_CPUC_0011287; AC_CPUC_0011290; AC_CPUC_0011293; AC_CPUC_0011296; AC_CPUC_0011299; AC_CPUC_0011302; AC_CPUC_0011305; AC_CPUC_0011308; AC_CPUC_0011311; AC_CPUC_0011314; AC_CPUC_0011317; AC_CPUC_0011320; AC_CPUC_0011323; AC_CPUC_0011326; AC_CPUC_0011329; AC_CPUC_0011334; AC_CPUC_0011337; AC_CPUC_0011340; AC_CPUC_0011343; AC_CPUC_0011348; AC_CPUC_0011351; AC_CPUC_0011356; AC_CPUC_0011359; AC_CPUC_0011594; AC_CPUC_0011618.

f. SoCalGas objects to this request as overly broad and unduly burdensome, and to the extent the request assumes the maximum operating pressure was applicable on or before October 23, 2015. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek information on or before October 23, 2015. Please see Response 1e.

QUESTION 2:

Please refer to SoCalGas opening testimony of Mr. Dan Neville, page 7, lines 17 to 18, which states, "Additionally, each well was connected to a kill network of piping so that an individual well could be killed from a nearby well." With this in mind, please answer the following during the 111 day incident beginning on October 23, 2015:

a. Was well SS-25 connected to the kill network of piping referenced above?
b. If the answer to question 2a is yes, which wells were connected to well SS-25 via the kill network of piping?
c. Did SoCalGas use any of the wells identified in response to question 2b to kill well SS-25?
d. If the answer to question 2c is "no" for any of the wells connected to well

SS-25 via the kill network of piping, why did SoCalGas not use that well in an effort to kill well SS-25?

e. Has SoCalGas successfully used the kill network of piping to kill an individual well at Aliso Canyon natural gas storage facility before?
f. If the answer to question 2e is yes, provide a spreadsheet that does the following:
    i. Identify each well that was killed.
    ii. Identify each well from which the kill was made through the kill network of piping.
    iii. Identify the date each such kill was made of each well that was killed.

RESPONSE 2:

a. Yes.
b. Please see SoCalGas' response to SED Data Request 47 Response 9 dated December 13, 2019 (Bates Range: I1906016_SCG_SED_DR_47_0000581) for the remote kill network that shows connections to gas storage wells.
c. No.
d. Please see SoCalGas' response to SED Data Request 47 Response 9 dated December 13, 2019.
e. SoCalGas objects to this request to the extent it assumes the kill network can only be used to kill a well from a nearby well. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objectionx, SoCalGas responds as follows. SoCalGas interprets this request to seek information prior to October 23, 2015. Yes, on December 15, 1988, Porter 44 was killed utilizing the kill network from its well pad.
f. SoCalGas objects to this request to the extent it assumes the kill network can only be used to kill a well from a nearby well. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objectionx, SoCalGas responds as follows. SoCalGas interprets this request to seek information prior to October 23, 2015. Please see Response 2e.

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QUESTION 3:

Please refer to SoCalGas opening testimony of Mr. Dan Neville, page 7, lines 18 to 20, which states, "Company procedures dictated that the well kill valves on the wellhead remain in the open position at all times during operations, thus maintaining remote kill ability at all times. With this in mind, please answer:

a. Provide the company procedure referenced in this passage. Be sure it is the procedure that was in place for the 111 days beginning on October 23, 2015.
b. Identify the page in this procedure that dictates what SoCalGas states in this passage.
c. Did SoCalGas follow its own procedure identified in this passage with respect to the well kill valves on SS-25?
d. If the answer to question 3c is no, what aspects of the procedure did SoCalGas not follow?
e. If the answer to question 3c is no, why did SoCalGas not follow certain aspects of this procedure?
f. Provide the records showing that the well kill valves on the SS-25 wellhead remained in the open position at all times during operations from October 1, 2015 to the end of February, 2016.

RESPONSE 3:

a. Please see the enclosed electronic documents with the following Bates Ranges: I1906016_SCG_SED_DR_48_0000001 - I1906016_SCG_SED_DR_48_0000007.
b. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "dictates." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to Section 4.2 of I1906016_SCG_SED_DR_48_0000001 - I1906016_SCG_SED_DR_48_0000007.
c. Yes.
d. N/A
e. N/A
f. SoCalGas objects to this request to the extent it assumes SoCalGas was required to keep the well kill valve in an open position at all times from October 1, 2015 through February 2016 and/or to maintain a record of the well kill valve remaining in an open position. Subject to and without waving the forgoing

objection SoCalGas responds as follows. Please see Response 3a.

QUESTION 4:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 3, lines 9 to 11, which states, "SoCalGas provided Boots & Coots personnel with information regarding the SS-25 well and the pending situation before they traveled so they were familiar with the well design on arrival and prepared to take action." With this in mind, please answer:

a. Provide the information SoCalGas provided Boots & Coots personnel regarding the SS-25 well and the pending situation before they traveled so they were familiar with the well design on arrival and prepared to take action.
b. Provide the requests Boots & Coots personnel made for information regarding the SS-25 well and the pending situation before they traveled.
c. Identify any questions from Boots & Coots personnel provided in response to question 4b that SoCalGas did not completely answer.
d. Provide the incomplete answers that were identified in response to question 4c.
e. Identify any questions from Boots & Coots personnel provided in response to question 4b that SoCalGas did not accurately answer.
f. Provide the inaccurate answers that were identified in response to question 4e.

RESPONSE 4:

a. Please refer to the following electronic documents with Bates range: I1906016_SCG_SED_DR_48_0000008 - I1906016_SCG_SED_DR_48_0000013.
b. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to Response 4a.
c. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not completely answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.
d. SoCalGas objects to this request to the extent it assumes Boots & Coots made

formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not completely answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.

e. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not accurately answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.

f. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not accurately answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.

QUESTION 5:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 6, lines 15 to 16, which states, "DOGGR's presence was significant, as the agency with the most operational expertise, and included reviewing several of the well kill plans prior to the work being performed." With this statement in mind, please answer:

a. Provide the well kill plans referenced in this statement that SoCalGas provided to DOGGR.
b. Provide the dates that SoCalGas provided these well kill plans to DOGGR

RESPONSE 5:

a. SoCalGas objects to this request to the extent it assumes SoCalGas provided the well kill plans to DOGGR. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. As described in the opening testimony of Mr. Schwecke, DOGGR was on site and reviewed several of the well kill plans. Boots and Coots well kill plans were previously provided with electronic Bates Range AC_CPUC_SED_DR_16_0000349 - AC_CPUC_SED_DR_16_0000360.
b. SoCalGas objects to this request to the extent it assumes SoCalGas provided the well kill plans to DOGGR. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See Response 5a.

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QUESTION 6:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 1, lines 12 to 14. "Out of an abundance of caution and prudence within two days of discovering the leak, SoCalGas began considering and preparing a contingency plan for a relief well in case a top well kill was not successful."

a. Please state all of the evidence SoCalGas had gathered within the first two days after the discovery of the leak that led SoCalGas to initiate plans for a relief well.
b. Provide all evidence that documents this early planning.

RESPONSE 6:

SoCalGas objects to this request as overly broad and unduly burdensome, and as vague and ambiguous, particularly with respect to the phrase "all of the evidence." SoCalGas further objects to this request to the extent it assumes SoCalGas began considering and preparing a contingency plan for a relief well based on gathered evidence. Subject to and without waving the forgoing objections SoCalGas responds as follows. SoCalGas interprets this request as seeking documentation which shows SoCalGas began considering and preparing a contingency plan for a relief well within the first two days after the discovery of the leak. Please refer to Section V of Mr. Schwecke's Opening Testimony. Please see the following electronic documents with Bates range: I1906016_SCG_SED_DR_48_0000058 - I1906016_SCG_SED_DR_48_0000059.

QUESTION 7:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 2, lines 9 through 12. "The personnel reported the unusual observation to a SoCalGas drilling manager, who instructed his drilling crew to mobilize the necessary equipment to stop the flow of gas from the reservoir, or 'kill' the well. SoCalGas crews mobilized resources, including wireline trucks, pump trucks, and vacuum trucks, which were on site or mobilized to the facility."

a. Please explain the purpose for the "kill" of each resource listed: wireline trucks, pump trucks, and vacuum trucks.
b. How long did it take to mobilize resources before everything was in place for a well kill? Was that amount of time typical for a SoCalGas well kill? If not,

what was different from others?

c. Explain how the auto-kill pipe network was or was not utilized during the first well kill.

RESPONSE 7:

a. Pump trucks pump kill fluids from storage tanks into a wellbore. Vacuum trucks load and transport kill fluid into storage tanks. Wireline refers to the cabling technology used to lower down wireline tools or measuring devices into a wellbore. A wireline unit was not mobilized or utilized for the first well kill attempt.
b. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term, "typical." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas typically mobilizes resources for planned well kills. This well kill was unplanned. Please refer to the previously provided electronic documents with Bates Range: AC_CPUC_SED_DR_16_0000649 - AC_CPUC_SED_DR_16_0000650.
c. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase, "auto-kill pipe network." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request to seek information related to the kill system. Please see SoCalGas' response to SED Data Request 47 Response 2d dated December 13, 2019.

QUESTION 8:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 2, line 31 through page 3, line 2. "While executing the procedure, SoCalGas observed fractures in the earth spreading out from the wellhead, and additional gas flow was noted through the cracks in the ground. SoCalGas personnel immediately shut down the well kill attempt and evacuated to a safe area."

a. Provide all procedures for well kills and safety procedures that SoCalGas personnel were using at the time of the SS25 well kill and identify within those procedures any instructions that address the circumstances of fractures in the earth spreading out from the wellhead and gas flow through the cracks.
b. Provide all documentation by SoCalGas personnel and its contractors of this initial event of fractures in the earth and gas flow from the fractures.

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RESPONSE 8:

a. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase, "procedures for well kills and safety procedures." Subject and notwithstanding the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request as seeking SoCalGas' formal written standards related to well kills as of October 24, 2015. Please see electronic document with Bates Range: I1906016_SCG_SED_DR_48_0000014 - I1906016_SCG_SED_DR_48_0000028.
b. SoCalGas objects to this request as overly broad and unduly burdensome. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided with electronic documents with Bates Range: AC_CPUC_SED_DR_16_0000651 - AC_CPUC_SED_DR_16_0000652.

QUESTION 9:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 3, footnote 1, last sentence: "To my knowledge, SoCalGas has required the assistance of a well control specialist on only one prior occasion that occurred in the 1970s." Provide all documentation of that well kill, including any procedures and documented "lessons learned" that resulted from that well kill event.

RESPONSE 9:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrases "all documentation" and "lessons learned." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek SoCalGas' formal written report regarding the incident at Fernando Fee 34. Please see electronic document with Bates Range: I1906016_SCG_SED_DR_48_0000029 - I1906016_SCG_SED_DR_48_0000057.

QUESTION 10:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 7, line 30 through page 8, line 2: "Also during the pendency of the leak, SoCalGas took reasonable and prudent action to implement other measures to reduce leak impacts and comply with the requests of regulators. SoCalGas ceased injection into the Aliso

Canyon storage facility and initiated withdrawals to lower reservoir pressure to support well kill efforts and reduce the amount of gas released."

a. Other than ceasing injection into the Aliso Canyon storage facility and initiating withdrawals, what reasonable and prudent actions did SoCalGas take that were actually implemented? Of those actions identified, which ones were successful and why?
b. Provide the Aliso Canyon Reservoir pressure on the date of each of the seven SS25 well kill attempts. Provide or cite to already provided records that are the source of this information.

RESPONSE 10:

a. Please refer to Section III.B.iv. of Mr. Schwecke's Opening Testimony.
b. Please see previously provided electronic documents with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 11:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 9, lines 16 to 18: ". . . when a wireline truck was required for diagnostic work, personnel had to carefully move the truck on site, install a lubricator to feed the wireline downhole, and transport and erect a crane to set the lubricator and run the wireline through the lubricator."

a. Provide documentation showing each time the wireline truck was moved onto the Well SS25 site for diagnostic work from October 23, 2015 until Well SS25 was declared sealed by DOGGR.
b. Provide all diagnostic records, including field notes and readable logs related to, or generated by, the wireline diagnostic activities.

RESPONSE 11:

a. Please refer to the previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.
b. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all diagnostic records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request to seek documentation

showing the wireline activities from October 23, 2015 through February 18, 2016. See Response 11a.

QUESTION 12:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 9, lines 28-29: "On October 25, 2015, Boots & Coots began assessing SS-25 and determined that the obstruction in the SS-25 tubing was a hydrate."

a. Explain why Boots & Coots decided the obstruction in the SS-25 tubing was a hydrate.
b. What, exactly, was the hydrate?
c. Provide all records used by Boots & Coots to make the determination that the obstruction was a hydrate.
d. Provide all records generated by Boots & Coots and the diagnostic procedures they used to make the determination that the obstruction was a hydrate.

RESPONSE 12:

SoCalGas objects to this request to the extent it does not seek information or documents but rather seeks to have SoCalGas explain the thought-process, understanding, and rational of a third party. SoCalGas further objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to the previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 13:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 11, lines 6-7: "…on November 6, 2015, Boots & Coots used the coiled tubing unit to successfully clear the hydrate from the SS-25 tubing."

a. Please explain in text how the coiled tubing unit was used to clear the hydrate from the SS-25 tubing.
b. Provide all records, including field notes and readable logs that document the use of the coiled tubing unit to clear the hydrate from the SS-25 tubing, and

the results, including any notes or tests used to confirm that it was hydrate that was blocking the SS-25 tubing.

c. Did SoCalGas or its contractors determine that there was, or was not, hydrate in the annular space between the tubing and casing of SS-25? Please explain how that determination was made and provide any records that were created that support that finding.

RESPONSE 13:

SoCalGas objects to this request to the extent it does not seek information or documents but rather seeks to have SoCalGas explain the understanding and determinations of a third party. SoCalGas further objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 14:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 12, lines 13-15:
". . . Boots& Coots was able to perform additional testing with diagnostic equipment, including temperature and noise tests through the tubing, to assess the conditions in the well."

a. Provide all records, including field notes, that document the testing and diagnostic results, including but not limited to temperature and noise tests through the tubing, to assess the conditions in the well.

b. What information was gained from the referenced testing that SoCalGas and its contractors used to design the next well kill?

RESPONSE 14:

SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

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QUESTION 15:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 12 footnote 7: "This withdrawal effort reduced the amount of gas that was released into the air."

a. What procedure did SoCalGas use for the withdrawal effort? Provide a copy of the version of the Procedure in effect on October 23, 2015 and any revisions to the procedure between October 23, 2015 and January 21, 2016.
b. Provide all records that show calculations and results that quantify the reduction of the amount of gas that was released into the air from November 11, 2015 to January 21, 2016.

RESPONSE 15:

a. Please see electronic document with Bates Range: I1906016_SCG_SED_DR_48_0000001 - I1906016_SCG_SED_DR_48_0000007.
b. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to the following link which provides the January 12, 2016 Aliso Canyon preliminary methane emissions estimates by the California Air Resources Board (CARB): https://ww3.arb.ca.gov/research/aliso_canyon/aliso_canyon_natural_gas_leak_updatessa_flights_thru_jan_12_2016.pdf?_ga=2.53068520.1705387443.1576530570-1855999613.1493842063

QUESTION 16:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 13, lines 7-8: "... first kill attempt through the coil tubing unit . . ."

a. How deep into the well did the coil tubing reach?
b. What testing or diagnostic equipment was being used during or immediately after this well kill attempt?
c. Provide all records, field notes and test results that document Boots & Coots' first well kill attempt.
d. Provide all records, field notes and test results from the first well kill attempt that document the results of Boots & Coots first well kill attempt.

RESPONSE 16:

SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 17:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 13, line 9: "Fluid pumped into the well appeared to escape into the surrounding subsurface formation."

a. What information or observations caused SoCalGas and its contractors to come to the conclusion that fluid was escaping into the surrounding subsurface formation?
b. During this kill attempt, at what depth was the fluid escaping into the surrounding subsurface formation?
c. If a depth was determined, or estimated, provide all records and data that SoCalGas and its contractors relied on to make that depth determination or estimate.

RESPONSE 17:

SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 18:

What was the bottom hole pressure used by SoCalGas and Boots & Coots to calculate the required weight of kill fluid for each of the seven well kill attempts?

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RESPONSE 18:

SoCalGas objects to this request to the extent it assumes SoCalGas calculated the required weight of kill fluid for each of the seven well kill attempts. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 19:

For well kill attempts 1 through 7, what models or standard calculations were used by SoCalGas and Boots & Coots to determine the best approach to kill the SS-25 well?

a. Provide documentation that explains the methodology for each well kill attempt.
b. Provide the calculations and results of the calculations for each well kill attempt.

RESPONSE 19:

Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 20:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 13, lines 2526: "Following each kill attempt, Boots & Coots performed diagnostic work to understand and assess the well."

a. Provide all records, including field notes, diagnostic test results and calculations generated or used by Boots & Coots to understand and assess the well.
b. For each well kill attempt, provide a text explanation of what Boots & Coots came to understand about the well after the kill attempt and how they assessed the condition of the well.

RESPONSE 20:

SoCalGas objects to this request to the extent it does not seek information or

documents but rather seeks to have SoCalGas provide an explanation of what Boots & Coots came to understand about the well after the well kill attempt and how they assessed the condition of the well. SoCalGas further objects to this request as vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 21:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 14, lines 6-7: "On December 22, 2015, Boots & Coots, with the assistance of the additional well kill experts and the National Laboratories, conducted the seventh top well kill attempt."

a. Provide a list of all of the experts (with their affiliations) who were involved in designing and implementing the seventh top well kill attempt.
b. Describe what was different about the seventh well kill attempt from the preceding 6 well kill attempts
c. Identify all models used by the experts identified in response to subpart a of this data request to design the seventh well kill attempt.
d. Provide all records, field notes, field monitoring, testing and diagnostics related to the planning, implementation and abandonment of the seventh SS-25 well kill attempt.

RESPONSE 21:

a. Boots & Coots ultimately designed and implemented the seventh top well kill attempt. The following consultants provided assistance during the seventh well kill attempt:

    - Don Shackelford (Sierra Hamilton)
    - John Wright (Wild Well)
    - Pete Slagel (1816 Hamilton)
    - Morton Haug Emilsen (Add Energy)
    - Jim Fox
    - James Mansdorfer

b. Please see previously provided electronic document with Bates Range:

AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

c. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.
d. Please refer to Response 21b.

QUESTION 22:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 16, lines 10-11:

"From December 15 to December 21, 2015. Boot & Coots and other contractors . . ."

a. Provide a list of all "other contractors" that drilled the relief well.
b. For each contractor identified, provide the name and title of the person(s) on site during the drilling.

RESPONSE 22:

Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808 and AC_CPUC_SED_DR_16_0000361 - AC_CPUC_SED_DR_16_0000648.

QUESTION 23:

Describe all of the activities that occurred at the site of Well SS-25 during the period from December 15, 2015 through February 10, 2016, identify the persons who were present at the well site during that period, and provide daily records that document all activities that occurred.

RESPONSE 23:

Please see previously provided electronic documents with Bates Range: AC_CPUC_SED_DR_16_0000361 - AC_CPUC_SED_DR_16_0000648 and AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-48 DATED DECEMBER 4, 2019

SOCALGAS RESPONSE DATED DECEMBER 19, 2019

QUESTION 24:

Please refer to the Prepared Opening Testimony of Ms. Amy Kitson on Behalf of Southern California Gas Company, page 3, lines 1-14, which states,

Solution 6: Conduct a Casing Failure Analysis

This mitigation/solution has already been implemented. The Blade Report incorrectly asserts that SoCalGas did not investigate the causes of previous casing failures. In order to remediate a leak discovered in any gas storage well, SoCalGas necessarily had to analyze and diagnose the issue first, before repairing it. In describing Solution 6, the Blade Report states that "casing failures need to be formally investigated." [Footnote 3, referencing page 232 of Blade Report.] The Blade Report fails to recognize, however, that a "formal investigation" of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well, nor necessary. While Blade was able to cut, extract, and thoroughly examine the casing at well SS-25 because there were plans to abandon the well, it is not feasible for SoCalGas to perform the same level of failure analysis on active gas storage wells. Further, although the SS-25 failure occurred at a relatively shallow depth, even Blade experienced difficulty cutting and extracting the casing. For casing failures thousands of feet belowground, operational issues may inhibit the cutting and extracting of casing.

With this passage in mind, please answer the following:

a. In stating that, "The Blade Report incorrectly asserts that SoCalGas did not investigate the causes of previous casing failures.", is it SoCalGas's point that SoCalGas did in fact investigate the causes of any previous casing failures at Aliso Canyon natural gas storage facility?

b. If the answer to question 24a is yes, please list in spreadsheet format all such previous casing failures at Aliso, which SoCalGas investigated. As part of this list, please include columns with the following information:
   1. The well that experienced the casing failure;
   2. The date or range of dates that SoCalGas investigated the casing failure;
   3. The individuals responsible for investigating the casing failure;
   4. The findings of the investigation of the casing failure;
   5. All documentation related to the investigation of the casing failure;
   6. Reference to the documents and page numbers showing the findings of

the investigation of each casing failure.

RESPONSE 24:

SoCalGas objects to this request to the extent it is overly broad, vague, ambiguous and unduly burdensome. SoCalGas further objects to this request to the extent it exceeds the scope of this proceeding as defined in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waving the forgoing objection SoCalGas responds as follows. SoCalGas assessed and addressed casing failures. SoCalGas can provide additional information regarding specific casing failures identified by SED.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-65 DATED APRIL 6, 2020)

SOCALGAS RESPONSE DATED APRIL 27, 2020

SoCalGas provides the following Responses to the Safety & Enforcement Division (SED) data request dated April 6, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 2:

Beginning on page 12, the testimony states, "Many of the Casing 'Leaks' Identified by SED Were Insignificant and Are Irrelevant to What Occurred at SS 25. . .SED's assertion, which is based solely on Blade's report [footnote omitted], mischaracterizes 60 well casing issues of varying cause and degree as relevant 'leaks.' SED seeks to show a 'pattern of SED's and Blade's assertions appear to be premised on the assumption that these casing issues were somehow similar to the circumstances that led to the failure at SS-25. [footnote omitted]. In fact, Blade's report combines a number

of different well conditions as 'leaks,' including perforations intentionally made by SoCalGas for water shut off tests and stage collar leaks. These well conditions have no relation to corrosion and present little risk of reason for concern. . .Blade's list of 63 relevant casing failures incorrectly includes the following:"

On pages 13-16, the passage then adds 11 bullet points which appear to make separate contentions in apparent support of this assertion. Most of footnotes 50 through 87 refer to Exhibits I-16 through I-60. In addition, footnote 85 references the SS-4-0 well file. Footnote 69 references Volume 4 of the Blade Report pages 25-28 and 39. Footnote 82 references Volume 4 of the Blade Report at pages 24, 25, 28, 29 and 31. For Each of these references to a Well File, please highlight or underline the exact sentence(s) that support the assertions in the testimony that cite the reference.

Response 2:

SoCalGas objects to this request to the extent it is argumentative in implying that the contentions regarding the 11 bullet points are not in support of the assertion in the first paragraph above. SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent that SoCalGas has already provided specific pages from large well files in support of its positions; SoCalGas notes that it did not cite to the entire well files in support of its contentions but provided specific pages. Subject to and without waiving the foregoing objections, SoCalGas responds as follows:

Pursuant to the testimony on pages 13-16, the individual wells are discussed via 11 separate bullet points. In order to provide consistency and for ease of readability, SoCalGas presents its responses to this question in the same format:

> **P-12**: See Blade Report, Volume 4, Table 14, Page 41, entry for January 1970, indicating a casing leak in 6 5/8 inch casing. SoCalGas notes that 1970 is prior to the well's conversion to a gas storage well.
>
> **SS-14**: Blade Report, Volume 4, Table 14, "Unable to test 7 inch casing at 156 feet". See previously produced document with Bates range AC_CPUC_0035016, entry from 5/14/76. This indicates that there is no casing leak at 156 ft. The well was successfully pressure tested from surface to 8,000'

under 2500 psi pressure. The well was subsequently successfully pressure tested from surface to 1,000' under 3000 psi pressure.

SS-17: See Blade Report, Volume 4, Table 14, Page 47, entry for July 1952: "Leak in 7 in. casing at 5.238 ft while drilling sidetrack hole using a whipstock." SoCalGas notes that 1952 is prior to the well's conversion to a gas storage well.

P-47: See previously produced document with Bates range AC_CPUC_0106570, 1973 Workover Report, noting (within the Notice of Intention to Deepen, Redrill, Plug or Alter Casing in Well) that the proposed work is as follows: "Jet perforate four ½" holes per foot and/or perforate two ½" holes per foot in the Sesnon zone as required to convert well to a gas storage well". This notice was filed in January 1973 and the referenced work was done in March 1973.

P-25R (4 leaks noted by Blade): See Blade Report, Volume 4, Table 14, Page 41; 4 separate casing leaks were noted in January and February, 1973. See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-20; page 14, showing a Notice of Well Work filed on January 15, 1973. This notice includes a reference to the following job: "Perforate and/or re-perforate in the Sesnon and Frew zones between 7876' and 8560' as required to convert well to a gas storage well".

FF-35E: See Blade Report, Volume 4, Table 14, Page 39; showing 2 separate casing leaks were noted in August and November, 1972. See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-21, page 1, showing the well was spud on 8-6-72. The daily drilling record for 8-27-72 on page 2 shows a leak in the stage collar at 1919' squeezed with cement. Further, the daily drilling record for 11-6-72 on page 5 shows a leak in the collar at 2344'. Both of the above casing leaks were clearly identified and mitigated during the initial drilling and testing of the FF-35E well during the conversion of the field to gas storage.

SF-2: A review of DOGGR records indicates that the well was drilled in 1953,

with workovers in 1956, 1961 and 1976. As there was no well work conducted in the period between 1961 and 1976, the work done on well SF-2 during 1976 was part of the conversion of the field to gas storage. See previously produced document with Bates range AC_CPUC_0109110, entry showing 6/7/67, documenting that the original wellhead was removed and a new wellhead installed on the well at that time. See also the entry of 6/10/76 on previously produced document with Bates range AC_CPUC_0109111, documenting of pressure testing from 9160' to surface, from 4500' to surface, etc. This is known as block testing. Both of the activities documented in the two entries (replacement of wellhead and block pressure testing) are indicative of well work that would be done during the conversion of a well to gas storage operations.

MA-1B: See Blade Report, Volume 4, page 15, stating "[w]ell MA-1B had a leak in the 8 5/8 in. casing while drilling". Clearly, this indicates the well was being drilled as a new storage well.

FF-32F: See Blade Report, Volume 4, Table 14, page 38, showing a casing leak in the 8 5/8" stage collar at 2001' in January, 1986. Stage collars leaks have nothing to do with corrosion or poor integrity of the well casing. See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-26, entry for 1/23/86, stating "[u]sing wireline, oriented Baker patch from 1978' – 2023' across stage collar at 2001'."

SS-25A: See Blade Report, Volume 4, Table 14, page 47, noting that in October, 1981 "a casing patch was set over a stage collar at 2,990'." See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-27, wellbore diagram, confirming the same.

FF-32E: See Blade Report, Volume 4, Table 14, page 38, showing a "leak in 8 5/8" stage collar at 2,988 ft." in September, 1975. See also the wellbore diagram in Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-29, confirming installation of a casing patch leak at 2967' to 3009', across the stage collar located at 2988'.

P-26B: See Blade Report, Volume 4, Table 14, page 42, showing a "casing leak in 8 5/8" stage collar at 2,793 ft." in August, 1981. See also the wellbore diagram in Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-33, confirming repair of a casing patch leak at 2726' to 2773', across the stage collar located at 2749'. Note that the original recorded depth of the stage collar was 2793', but was later located at 2749'.

SS-25B: See Blade Report, Volume 4, Table 14, page 47, showing that in October, 1976 a casing patch was set across the stage collar. See also the wellbore diagram in Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-36, confirming the location of a casing patch leak at 2907" to 2929', over the stage collar at 2918'.

FF-35B: See Blade Report, Volume 4, Table 14, page 39, noting that September 1978 a leak was detected "in [the] 8 5/8" casing at 3,997 ft. at stage collar. Set casing patch 4.016-3,974 ft." See also the entry on Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-39 for September 15, 1978, noting that a casing patch was set "at 4,016 - top 3,974' (42') over stage collar leak at 3997'."

SS-44A: See Blade Report, Volume 4, Table 14, page 48, entry for July 1978, noting a "[l]eak in 8 5 in. stage collar at 3,958 ft. Set a casing patch." See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-40, entry for July 11, an 8 5/8" casing patch was set from 3936' to 3978' over stage collar at 3958'."

P-47: The Prepared Reply Testimony, Chapter I (Hower/Stinson), incorrectly identifies this leak at 7,328' as a repair of water shut-off holes. The leak was found while testing and plugging water shut off holes in the casing at 8,138', but was not associated with the water shut off.

Frew-3: See Blade Report, Volume 4, Table 14, page 40, stating: "Well P&A. Leak in 5 ½ in. inner casing at 7,500 ft. Ran 5 ½ in. USIT log, anomaly at 7,532-7,548 ft. Tight spot in 7 in. casing at 7,543 feet. Leak in 7 in. casing 2,643 – 2,658 ft. Ran 7 in. USIT log, anomaly at 3,233 ft." The leak in the 5

½ in. inner string is a legitimate leak and was counted as such. However, the leak behind that inner string, in the 7 in. casing, was remediated via the running of the inner string. The leak was originally identified in January 1986, per referenced Blade table 14. The 5 ½ in. inner string was run to repair that leak. The leak should not be counted again when the 5 ½ in. inner string is ripped out of the well during plug and abandon operations.

FF-35C: See Blade Report, Volume 4, Table 14, page 39, entry for September 1990, stating "[v]ertilog showed possible penetration at 6832 ft, 2350 ft 40-60% penetration, 966 ft > 60% penetration." This is not indicative of a casing leak. See also Ex. I-44, page 1, entry for 9-19-90, indicating "[f]ound areas of corrosion in 8 5/8" casing at 6832', 2350', and 966'." See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-45, page 1, entry for 9-21-90, indicating, "[f]inished running in well with packer and bridge plug. Set bridge plug at 6895' (top) and tested to 1500 psi (5601' – 6895'). Recovered bridge plug and set at 5633'. Tested 8 5/8" casing to 900 psi (0' – 5633'). Set bridge plug at 4407' and tested 8 5/8" casing to 1500 psi (0' – 4107'). All tests good – no leaks."

P-32 (2 leaks noted by Blade): See Blade Report, Volume 4, Table 14, page 42, stating in the entry for September, 2016, "POH inner casing. Squeezed cement leaks in 7 in casing at 654-845 ft and 1,300 – 1,323 ft. Ran and cemented 5 ½ in. inner casing". The Blade entry clearly shows that the holes in the 7 in casing were behind an inner string and were, therefore, not casing leaks as they were mitigated by the inner string. The only reason this work was done in 2016 was due to the new regulations from DOGGR post SS-25 incident.

P-35: See Blade Report, Volume 4, Table 14, page 43, entry of February 2016, indicating Vertilog showed penetration indications at various depths. However, Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-49, page 9, entry for daily operations for 3/1/2016 – 3/2/2016, indicates multiple pressure tests were run throughout the entire wellbore with all indicating "Good Test."

SS-4A: See Blade Report, Volume 4, Table 14, page 45 indicating that the SS-4A well had a leak repaired in January 2017 between 753 – 860 feet. This was not the case. The cement squeeze operations referenced by Blade were actually associated with pre-abandonment operations conducted on a production casing behind an inner casing string. See electronic documents with Bates range I1906016_SCG_SED_DR_65_0000002 through I1906016_SCG_SED_DR_65_0000004. Perforations are noted between the depths of 815 – 825 feet. These perforations were required by DOGGR so that SoCalGas could pre-abandon zones at the base of the fresh water behind the production casing prior to cementing an inner string of casing. There was no casing leak.

P-42C: This was not a casing leak. See Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-53. Note entry on 11-14-76: "RIH to 6,790 attempted to test 9 5/8" casing lap and 7 5/8" casing to RBP @ 7,490." A casing, or liner, lap refers to the interval between the liner top and the shoe of the outer casing. Thus, the leak referred to in the P-42C well file was an issue with an internal seal between the casing and a liner.

Ward 3A: See Blade Report, Volume 4, Table 14, page 48, indicating casing damage and a leak in December 2016. In August of 2016, the entire casing string was successfully pressure tested to 1000 psi as witnessed and approved by DOGGR. See electronic document with Bates range I1906016_SCG_SED_DR_65_0000001. The leaks noted subsequent to this successful testing were associated with milling operations on a packer initiated on 12/5/2016. See electronic documents with Bates range I1906016_SCG_SED_DR_65_0000005 through I1906016_SCG_SED_DR_65_0000012. Any damage caused to the casing was associated with these internal milling operations and not external corrosion.

P-32B: See Blade Report, Volume 4, Table 9, pages 24 and 25. Three separate casing leak events are counted by Blade. All of these holes were in the same 8 5/8" casing string and identified at the same time. Per the referenced Table 9 in the Blade Report; Volume 4, the holes were all

remediated with the same 7" liner. This should have been counted as one singular casing leak event by Blade and not three separate events. Thus, we have excluded two casing leaks from Blade's total count.

SS-4A: See Blade Report, Volume 4, Table 9, page 28. Two separate casing leak events are counted by Blade. See also Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-56, page 3, entries for 1-8-79 and 1-9-79, showing the identification of the holes within the same casing string. These holes were all remediated during the same workover. This should have been counted as one singular casing leak event by Blade and not two separate events. Thus, we have excluded one casing leak from Blade's total count.

MA-5A: See Blade Report, Volume 4, Table 9, page 31. Two separate casing leak events are counted by Blade. The holes were identified within the same casing string at the same time. These holes were all remediated during the same workover. This should have been counted as one singular casing leak event by Blade and not two separate events. Thus, we have excluded one casing leak from Blade's total count.

SoCalGas notes that bullets 7 – 11 do not discuss casing leaks, but instead discuss four separate events of parted casings. Therefore, SoCalGas relies on its Prepared Reply Testimony, Chapter I (Hower/Stinson), pages 15-16 to cover the discussion of these issues.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-71 DATED APRIL 9, 2020)

SOCALGAS RESPONSE DATED APRIL 21, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 9, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

Please refer to the passage on page 17 that states, "Corrosion from Groundwater Did Not Create the Holes on the 7-Inch Production Casing." (Emphasis in Original)...

a. Is it SoCalGas's contention that corrosion from groundwater was unrelated to the "holes on the 7-inch production casing" noted in this statement?
b. If the answer to question 1a is yes, provide all documentation supporting such a statement.
c. If the answer to question 1a is yes, please explain how the corrosion was caused and what caused the corrosion.

d. Please explain how SoCalGas was able to determine that the corrosion was caused by such.
e. What tools and/or tests were used to determine the cause of the corrosion?
f. Please provide SoCalGas' analyses and documentation in support of its conclusion as to the causes of corrosion.
g. When did SoCalGas conduct this/its corrosion analyses of SS-25?

RESPONSE 1:

a. No. SoCalGas notes that the sentence referenced in this request includes a typographical error originally appearing as a point-heading in SoCalGas' Reply Testimony (See SoCalGas Reply Testimony Chapter I (Hower/Stinson) at 17.) While the point-heading references the "7-Inch Production Casing," as evident by the testimony that follows, the sentence should have instead referenced the "11 ¾-Inch Surface Casing." Correctly stated in full, this point-heading should read: "Corrosion from Groundwater Did Not Create the Holes on the 11 ¾-Inch Surface Casing." Given that this correction likely clarifies any confusion as to SoCalGas' Reply Testimony on this issue, SoCalGas does not provide any further responses to Question 1, subparts b–g.

QUESTION 2:

Under the heading quoted in question 1, there is the passage that states, "However, SED's testimony fails to mention that Blade concluded that the incident itself, not corrosion, likely caused the holes. While the groundwater may have "accessed" the surface casing and there might have been corrosion on the outside of the surface casing, there is no evidence that this corrosion compromised the integrity of the surface casing. In fact, Blade concluded that the holes found in the surface casing were likely a consequence of the pressure surge caused by the axial rupture of the production casing and, thus occurred post-leak. With this passage in mind, please clarify:

a. Please clarify which portions of this passage are referencing the following:
   i. The 7-inch casing.
   ii. The 11 ¾ inch diameter surface casing.
   iii. The tubing.
b. Provide documentation that supports each sentence in the passage that is clarified in response to question 2a, including page number references and

quotes to the passage in support.

RESPONSE 2:

a. SoCalGas objects to this request to the extent it is vague and ambiguous. SoCalGas further objects to this request to the extent it seeks information that has already been provided to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. The passage discusses both the 7-inch production casing and the 11 ¾-inch surface casing. The first sentence quoted above refers to the 58 holes found by Blade in the 11 ¾-inch surface casing. The other sentences in the passage explicitly and specifically identify the relevant casing; the quoted passage does not reference the 2 7/8-inch tubing.
b. SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence," and to the extent it seeks information that is equally available to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Blade Report at 119 ("The holes are likely a consequence of the axial rupture.")

QUESTION 3:

On page 18, footnote 93 states in part. "It should also be noted that SED's apparent premise underlying this argument is that SoCalGas failed to inspect and identify the 58 holes in the surface casing described above in Section III-A. However, as noted above, Blade determined the holes were most likely caused by the explosion itself. It would likely have been impossible for SoCalGas to have found these holes using any inspection techniques. With this passage in mind, please answer:

a. Please clarify which portion of the well (7-inch casing, 11 ¾ diameter surface casing, or tubing) that is being referenced by this passage.
b. Please provide a page and sentence in Blade's reports where Blade stated that SoCalGas failed to inspect and identify the 58 holes in the surface casing described above in Section III-A.

RESPONSE 3:

a. This passage relates to the 11 ¾-inch diameter surface casing.
b. SoCalGas objects to this request to the extent it mischaracterizes SoCalGas' Reply Testimony. SoCalGas' Reply Testimony stated that it was SED's premise, not Blade's, that SoCalGas failed to inspect and identify the 58 holes in the surface casing.

QUESTION 4:

On page 18, the testimony states: "There Were and Are No Tools Available to Perform the Kinds of Inspections SED Demands." With this statement in mind, please answer:

a. What exactly are the kinds of inspections that the testimony asserts that SED demands?
b. Provide all documentation, including page number reference and quote to applicable passage, supporting the answer to question 4.a.

RESPONSE 4:

a. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "SED demands," and unduly burdensome to the extent SED asks SoCalGas to identify and/or interpret SED's testimony for SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands that SED's Opening Testimony contemplates an inspection capable of assessing corrosion on the surface casing. As noted in SoCalGas' Reply Testimony, while it is unclear, SED makes a number of allegations in its Opening Testimony implicating SoCalGas' alleged failure to assess the SS-25 surface casing. See, for example, SED's Opening Testimony at 11-12:

> Blade identified a total of 58 through-wall-metal-loss holes in the 990-foot deep, 11-3/4-inch diameter steel surface casing walls of well SS-25. Fifty of the steel surface casing holes in SS-25 were identified at depths ranging between approximately 150 feet and approximately 195 feet. The

> through-wall-metal-loss holes were identified using various technologies, including caliper, UCI and HRVRT. Camera logging data were consistent with the technology logging data, with photographs matching the sensory logging tools' metal loss locations.
>
> ***
>
> In light of the extent of the corrosion on SS-25, and the resulting incident, SED considers SoCalGas's failure to investigate the specific corrosion problems on Well SS-25 its own a separate violation of California Public Utilities Code Section 451.

(Internal citations omitted). See also, SED's Opening Testimony at 25:

> Surface casing corrosion was identified in several wells where casing inspection logs were run as part of the P&A (plug and abandonment) operations. SS-25's surface casing had the worst condition; logs showed multiple through-wall holes in the 11 ¾ in. casing from approximately 134 to 300 ft. The holes in the surface casing likely contributed to the 7-inch production casing corrosion and allowed ground water and oxygen to enter the 11 ¾ inch x seven-inch annulus.

(Internal citations omitted). See also, SED's Opening Testimony at 44-45:

> Blade did not find any SoCalGas records that identified the location and nature of the groundwater in and around the SS-25 well site. Consequently, a correlation of the groundwater locations and the depth of surface casing shoes, and an assessment of the potential for surface casing corrosion were not done. The possible corrosion risks to surface casings or production casings were unknown.
>
> ***
>
> SoCalGas's failure to assess the relationship between

> groundwater in and around the SS-25 wellsite, and the surface casing corrosion of that well on SS-25 constitute a violation of Section 451.
>
> ***
>
> During the RCA Investigation Phase 3 evaluation of the condition of the 11 ¾- inch surface casing, holes in the casing were found between 134 feet and 300 feet. These holes were caused by the escaping gas pressure following external corrosion because the casing was neither fully cemented nor cathodically protected leaving the casing exposed to an environment conducive to corrosion.

(Internal citations omitted). Again, while SED's testimony on these issues is not clear, SoCalGas understood SED's position to be that SoCalGas should have inspected the surface casing in the same or similar manner to the inspections conducted by Blade during its root cause analysis.

b. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "SED demands," and unduly burdensome to the extent SED asks SoCalGas to identify support for SED's testimony to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see SoCalGas' Response to Question 4a. Also see Blade Report at 37-49 (discussing removal of the tubing and production casing) and at 118 (noting the difficulties with inspecting the surface casing even after the production casing had been removed).

<u>QUESTION 5:</u>

On pages 18 and 19, the testimony states, "The testimony from SED and Cal Advocates implies that various technologies were available which could have easily identified these holes. [Footnote omitted.] This is incorrect. Blade was able to analyze the surface casing and identify the holes only because the production casing had been cut off and extracted from the SS-25 well after the incident. Extracting the production casing exposed the surface casing for inspection and examination. During the normal operation of the SS-25 well, the production casing, of course, would have remained cemented in

the well. [Footnote omitted.]. As such, caliper logs, cameras and casing inspection logs would not have been able to evaluate the integrity of the surface casing because due to the presence of the production casing. [Footnote omitted.]. With this passage in mind, please answer:

a. Please provide the exact wording in SED and Cal Advocates' testimony that refers to "these holes" with reference to various technologies that were available for inspections.
b. If no tools are available to evaluate the integrity of the surface casing, how can SoCalGas safely operate its gas storage fields?

RESPONSE 5:

a. SoCalGas objects to this request to the extent it mischaracterizes SoCalGas' Reply Testimony. SoCalGas' Reply Testimony states that SED and Cal Advocates imply that technologies were available to discover the holes in the surface casing; it does not state that SED or Cal Advocates specifically state that technologies were available to discover the holes in the surface casing. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See SED Opening Testimony at 25, discussing SoCalGas' failure to inspect the SS-25 well casing as arising from the 1988 memo in the context of the 58 holes in the surface casing. For Cal Advocates, please see SoCalGas Reply Testimony, Chapter I, Footnote 95.

b. SoCalGas objects to this request on the basis it is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The integrity of the surface casing is a non-critical issue for the safe operation of gas storage fields. When drilling a well, the objective is not to shield the surface casing from contact with fresh-water aquifers (i.e., groundwater). The objective instead is to prevent contamination of the fresh-water aquifers from drilling fluids during the drilling of the well. Additionally, the surface casing provides no pressure barrier between the wellbore and the surrounding strata. The surface casing is not designed to contain gas within the wellbore. Therefore, after the initial drilling of the well, the integrity of the surface casing is a non-critical issue.

For example, Blade notes that the "main function of surface casing is to isolate fresh water and provide structural support for the rest of the well, and not to provide a gas tight barrier to a production string." Blade Report at 86. Further, the DOGGR regulations state only that a "[s]urface casing shall provide for control of formation fluids, for protection *of* shallow usable groundwater, and for adequate anchorage for blowout prevention equipment." Cal. Code Regs. §1935.2 (emphasis added).

Again, SoCalGas notes that Blade determined the likely cause of the holes in the surface casing was the axial rupture; the holes in the surface casing most likely did not exist prior to the incident and therefore did not provide the pathway for groundwater to access the production casing. *See* response to Question 2(b) above.

However, even if the holes in the surface casing were the pathway for groundwater to access the production casing, the integrity of the surface casing would still be a non-critical issue. If the production casing were cemented all the way to the surface, the groundwater could not have caused corrosion of the casing string. However, production casing in the SS-25 well was not cemented to surface. This is a completely separate issue from the integrity of the surface casing. While it is now required that production casing be cemented to surface, in 2015 this was not a requirement, nor was it an industry standard practice.

QUESTION 6:

On page 20, the testimony states, "Additionally, both the Blade Report and the SED testimony present a figure which shows the groundwater entering the annulus of the 7-inch production casing and the wellbore below the depth of the surface casing. [Footnote omitted.]. Thus, the postulated mechanism by which the groundwater accessed the annulus of the 11 ¾ inch surface casing and the 7 inch production casing is via ingress below the surface casing shoe where the production casing is not cemented and then mixing with the fluids outside the production casing which extend upwards into the annulus between the production casing and the surface casing." With this passage in mind, please answer:

a. Is it SoCalGas's contention that the "postulated mechanism" identified above is inaccurate?

b. If so:
   i. Is it SoCalGas's contention that groundwater did not access the inside of the 11 ¾ surface casing?
   ii. Is it SoCalGas's contention that groundwater did not access the 7 inch production casing?

c. If the answer to any portion of question 6b is yes, please provide the documentation in support of the answers, including page number references and quotes to the supporting passages.

RESPONSE 6:

a. No.
b.
   i. N/A.
   ii. N/A.
c. N/A.

QUESTION 7:

On page 20, the testimony states: The SS-25 well was drilled in late 1953 and early 1954 by Tidewater Associated Oil Company. At the time that Tidewater drilled the well, they would have set the 11 ¾ inch surface casing at a depth reviewed and approved by the DOGGR, which was below all known shallow groundwater sources based upon local hydrogeology.

a. Assuming the facts asserted in this passage are true, please answer:
   i. After the drilling of the SS-25 well, did SoCalGas ever check the levels of shallow groundwater sources?
   ii. If so, when?
   iii. After the drilling of the SS-25 well, did SoCalGas ever check the integrity of the cement behind the surface casing?
   iv. If so, when?
   v. Please provide the bates page numbers in the SS-25 well file that support the assertion in a.iv.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-71 DATED APRIL 9, 2020)

SOCALGAS RESPONSE DATED APRIL 21, 2020

RESPONSE 7:

a.

i. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "check." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas did not do any independent, direct testing of the levels of shallow groundwater sources after taking over the well from Tidewater.

ii. N/A.

iii. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "check." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

iv. N/A.

v. N/A.

Well	Discovery Date	Stop Date	Type	Depth, ft	Method of Mitigation	Method of Repair	Cause of Leak
P32	12/13/1973	8/6/1975	Casing	4510	Killed well	Innerstring installation	Unknown
FF32C	4/4/1974	6/17/1976	Stage collar	3738	Killed well	Casing patch installation	Stage collar port leaking
FF35E	12/14/1974	11/13/1976	Stage collar	2344	Killed well	Innerstring installation	Stage collar port leaking
P12	4/30/1975	12/4/1975	Casing	3634	Killed well	Cement squeeze, casing patch, and convert to tubing flow	Unknown
P45	2/26/1976	4/25/1977	Casing	500	Killed well	Innerstring installation	Unknown
FF32E	3/15/1976	11/2/1976	Casing shoe	7122	Killed well	Cement squeeze	Insufficient cement integrity
P47	8/27/1976	9/9/1976	WSO perforations	7328	Closed sliding sleeve	Cement squeeze	Insufficient cement integrity
P32C	9/21/1976	10/6/1976	Stage collar	3165	Killed well	Cement squeeze & casing patch	Stage collar port leaking
SF1	11/24/1976	12/23/1977	Casing	1378	Killed well	Innerstring installation	Unknown
SS44A	4/4/1977	6/2/1977	Stage collar	8850	Set tubing plug at 8790'	Cement squeeze & casing patch installation	Stage collar port leaking
SS5	8/30/1977	11/23/1977	Casing	1050	Killed well	Innerstring installation	Unknown
FF35B	10/14/1977	7/25/1978	Casing patch	3978	Killed well	Casing patch replacement	Casing patch seal leaking
P44	12/9/1977	1/24/1978	Casing	4000	Killed well	Cement squeeze & casing patch	Unknown
FF35	6/15/1978	6/22/1978	Casing shoe	6900	Killed well	Cement squeeze, plugged and abandoned	Insufficient cement integrity
FF35A	6/15/1978	7/25/1978	Casing shoe	6640	Killed well	Cement squeeze	Insufficient cement integrity
SS11	9/19/1978	11/8/1978	Casing shoe	8692	Killed well	Cement squeeze	Insufficient cement integrity
SS4A	10/5/1978	12/15/1978	Casing	4291	Killed well	Cement squeeze and set straddle packers	Unknown
SS10	11/8/1978	12/9/1978	Casing	4492	Killed well	Casing patch installation	Unknown
SS11	7/24/1979	3/24/1980	Casing shoe	8730	Set tubing plug at 8659'	Cement squeeze	Insufficient cement integrity
SS25B	8/3/1979	10/18/1979	Casing shoe	8434	Set tubing plug at 8395'	Cement squeeze	Insufficient cement integrity
SS44A	8/3/1979	9/5/1979	Casing patch	3977	Killed well	Casing patch replacement	Casing patch seal leaking
P26C	8/27/1979	7/16/1980	Casing	6586	Killed well	Cement squeeze and casing patch	Unknown
FF35B	2/27/1980	4/17/1980	Casing patch	3978	Killed well	Cement squeeze & casing patch replacement	Casing patch seal leaking
P26C	5/13/1980	7/16/1980	Casing shoe	7850	Killed well	Cement squeeze & casing patch	Insufficient cement integrity
FF32C	7/24/1980	7/29/1981	Casing patch	3738	Killed well	Casing patch replacement	Casing patch seal leaking
FF35B	8/13/1980	10/29/1980	Casing shoe	7200	Killed well	Cement squeeze & casing patch replacement	Insufficient cement integrity
P43	10/8/1980	4/23/1981	Casing	2020	Killed well	Casing patch installation	Unknown
P26B	12/15/1980	8/7/1981	Stage collar	2793	Killed well	Installed casing patch	Stage collar port leaking
P4	4/23/1981	6/6/1982	Casing shoe	7600	Killed well	Cement squeeze, plugged and abandoned	Insufficient cement integrity
MA1B	5/8/1981	8/14/1981	Casing patch	1594	Killed well	Casing patch replacement	Casing patch seal leaking
P69A	5/19/1981	10/30/1981	Casing	4913	Killed well	Cement squeeze & casing patch installation	Unknown
P42	7/13/1981	7/13/1982	Casing shoe	8020	Killed well	Cement squeeze, plugged and abandoned	Insufficient cement integrity
SS25A	9/22/1981	10/2/1981	Stage collar	2990	Set tubing plug at 8190'	Casing patch installation	Stage collar port leaking
SS4	9/24/1981	12/1/1981	Casing	8600	Killed well	Cement squeeze	Unknown
MA1B	10/7/1981	1/5/1982	Casing patch	1594	Killed well	Cement squeeze & casing patch replacement	Casing patch seal leaking
SS6	2/7/1982	8/12/1982	Casing shoe	8444	Killed well	Cement squeeze	Insufficient cement integrity
P26C	4/2/1982	7/6/1982	Stage collar	6586	Killed well	Cement plug back	Stage collar port leaking
MA1B	4/30/1982	11/18/1982	Casing patch	1594	Killed well	Innerstring installation	Casing patch seal leaking
MA1B	4/30/1982	11/18/1982	Casing shoe	7200	Killed well	Cement squeeze	Insufficient cement integrity
P69A	6/18/1982	1/7/1983	WSO perforations	7572	Killed well	Cement squeeze and innerstring installation	Insufficient cement integrity
SS2	6/25/1982	12/8/1982	WSO perforations	8540	Killed well	Cement squeeze	Insufficient cement integrity
SS25A	10/18/1982	10/23/1982	Casing patch	2990	Set tubing plug at 8190'	Convert to tubing flow	Casing patch seal leaking
P26E	12/3/1982	1/6/1983	Casing shoe	7360	Killed well	Cement squeeze	Insufficient cement integrity
SS24	3/29/1984	1/11/1985	Casing shoe	8750	Killed well	Cement squeeze	Insufficient cement integrity
P45	4/15/1984	6/5/1985	Casing	3000	Killed well	Innerstring replacement	Unknown
F3	6/13/1984	6/14/1984	Casing	3240	Killed well	Cement squeeze & innerstring installation	Unknown
P32E	7/6/1984	7/16/1984	Stage collar	3014	Set tubing plug at 7397'	Casing patch installation	Stage collar port leaking
FF32F	7/30/1984	8/20/1984	Stage collar	2001	Set tubing plug at 7050'	Casing patch installation	Stage collar port leaking
FF32B	8/13/1984	8/30/1984	Stage collar	2980	Set tubing plug at 7329'	Casing patch installation	Stage collar port leaking
SS25B	8/12/1986	11/21/1986	Casing patch	2918	Set tubing plug at 8380'	Casing patch replacement	Casing patch seal leaking
FF32E	10/29/1986	11/10/1986	Stage collar	3000	Closed sliding sleeve	Convert to tubing flow	Stage collar port leaking
SS29	9/24/1987	9/20/1991	Casing shoe	8330	Killed well	Cement squeeze	Insufficient cement integrity
F4	1/2/1988	1/29/1988	Casing	32	Set tubing plug at 8212'	Innerstring installation	Unknown
FF35C	9/15/1989	6/6/1990	Stage collar	1955	Killed well	Innerstring installation	Stage collar port leaking
FF34A	9/10/1990	9/11/1990	Casing	1580	Set tubing plug at 7489'	Cement squeeze, casing patch & innerstring installation	Memo in file indicates cause was corrosion
P26	7/21/1991	8/30/1991	Casing shoe	7513	Killed well	Cement squeeze and innerstring installation	Insufficient cement integrity
P26	6/14/1992	8/11/1992	Casing	40	Closed sliding sleeve	Replaced top two joints of innerstring	Unknown

SS11	7/28/1992	4/19/1993	Casing shoe	8700	Killed well	Cement squeeze	Insufficient cement integrity
FF32	9/10/1992	12/14/1992	Casing shoe	7040	Killed well	Cement squeeze	Insufficient cement integrity
FF33	7/28/1993	4/27/1994	Casing	115	Killed well	Casing patch installation	Unknown
SS14	4/30/1997	5/31/1997	Casing	622	Closed sliding sleeve	Replaced top section of casing	Unknown
FF32F	1/5/1999	1/6/1999	Casing patch	2001	Set tubing plug at 7050'	Casing patch replacement	Casing patch seal leaking
FF32C	7/25/2000	8/31/2010	Casing patch	3738	Set tubing plug at 7151'	Casing patch replacement	Casing patch seal leaking
SS8	11/17/2003	8/31/2006	Casing	8100	Set tubing plug at 8542'	Set straddle packer casing patch	Unknown
F9	7/10/2008	5/7/2009	Casing	1900	Killed well	Plugged and abandoned	Unknown
FF32F	9/23/2009	11/6/2009	Casing patch	2001	Set tubing plug at 7050'	Innerstring installation	Casing patch seal leaking
P26C	10/12/2009	11/6/2009	Casing patch	1684	Killed well	Casing patch replacement	Casing patch seal leaking
P50A	7/16/2010	7/16/2010	Casing	1020	Closed sliding sleeve	Cement squeeze & innerstring installation	Casing inspection log indicates corrosior
SS8	8/12/2010	10/29/2010	Casing patch	8100	Killed well	Cement plugback	Straddle packer leaking
P26E	8/1/2011	11/4/2013	Stage collar	2943	Killed well	Plugged and isolated, repair tbd	Stage collar port leaking
P26C	8/11/2011	9/29/2011	Casing shoe	7819	Killed well	Cement squeeze	Insufficient cement integrity
P32D	8/16/2011	6/26/2012	Stage collar	3011	Closed sliding sleeve	Convert to tubing flow	Stage collar port leaking
SS10	5/26/2012	6/26/2012	Casing patch	4492	Set tubing plug at 7916'	Casing patch replacement	Casing patch seal leaking
FF32C	10/8/2012	4/20/2016	Casing patch	3738	Killed well	Cemented innerstring installation	Casing patch seal leaking
MA5A	5/7/2013	5/7/2013	Casing patch	1880	Set tubing plug at 7176'	Plugged and abandoned	Straddle packer leaking
FF32D	10/14/2013	10/16/2013	Casing	6313	Set tubing plug at 7010'	Cement squeeze & plugback	Casing inspection log indicates corrosion
SS44A	10/15/2013	10/16/2013	Casing	17	Killed well	Plugged and isolated, repair tbd	TBD
P50A	5/3/2014	5/7/2014	Innerstring	1020	Set tubing plug at 6848'	Plugged and abandoned	Unknown
P42B	5/19/2014	6/19/2014	Casing	7200	Killed well	Patched by liner top extension	Unknown
SS25	10/23/2015	2/18/2016	TBD	TBD	Relief well	TBD	TBD
P42B	11/10/2015	1/21/2016	Casing	7200	Killed well	Plugged and isolated	Unknown

WSO - Water Shut Off

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-71 DATED APRIL 9, 2020)

SOCALGAS RESPONSE DATED APRIL 21, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 9, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

Please refer to the passage on page 17 that states, "Corrosion from Groundwater Did Not Create the Holes on the 7-Inch Production Casing." (Emphasis in Original)...

a. Is it SoCalGas's contention that corrosion from groundwater was unrelated to the "holes on the 7-inch production casing" noted in this statement?
b. If the answer to question 1a is yes, provide all documentation supporting such a statement.
c. If the answer to question 1a is yes, please explain how the corrosion was caused and what caused the corrosion.

d. Please explain how SoCalGas was able to determine that the corrosion was caused by such.
e. What tools and/or tests were used to determine the cause of the corrosion?
f. Please provide SoCalGas' analyses and documentation in support of its conclusion as to the causes of corrosion.
g. When did SoCalGas conduct this/its corrosion analyses of SS-25?

RESPONSE 1:

a. No. SoCalGas notes that the sentence referenced in this request includes a typographical error originally appearing as a point-heading in SoCalGas' Reply Testimony (See SoCalGas Reply Testimony Chapter I (Hower/Stinson) at 17.) While the point-heading references the "7-Inch Production Casing," as evident by the testimony that follows, the sentence should have instead referenced the "11 ¾-Inch Surface Casing." Correctly stated in full, this point-heading should read: "Corrosion from Groundwater Did Not Create the Holes on the 11 ¾-Inch Surface Casing." Given that this correction likely clarifies any confusion as to SoCalGas' Reply Testimony on this issue, SoCalGas does not provide any further responses to Question 1, subparts b–g.

QUESTION 2:

Under the heading quoted in question 1, there is the passage that states, "However, SED's testimony fails to mention that Blade concluded that the incident itself, not corrosion, likely caused the holes. While the groundwater may have "accessed" the surface casing and there might have been corrosion on the outside of the surface casing, there is no evidence that this corrosion compromised the integrity of the surface casing. In fact, Blade concluded that the holes found in the surface casing were likely a consequence of the pressure surge caused by the axial rupture of the production casing and, thus occurred post-leak. With this passage in mind, please clarify:

a. Please clarify which portions of this passage are referencing the following:
   i. The 7-inch casing.
   ii. The 11 ¾ inch diameter surface casing.
   iii. The tubing.
b. Provide documentation that supports each sentence in the passage that is clarified in response to question 2a, including page number references and

quotes to the passage in support.

RESPONSE 2:

a. SoCalGas objects to this request to the extent it is vague and ambiguous. SoCalGas further objects to this request to the extent it seeks information that has already been provided to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. The passage discusses both the 7-inch production casing and the 11 ¾-inch surface casing. The first sentence quoted above refers to the 58 holes found by Blade in the 11 ¾-inch surface casing. The other sentences in the passage explicitly and specifically identify the relevant casing; the quoted passage does not reference the 2 7/8-inch tubing.
b. SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence," and to the extent it seeks information that is equally available to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Blade Report at 119 ("The holes are likely a consequence of the axial rupture.")

QUESTION 3:

On page 18, footnote 93 states in part. "It should also be noted that SED's apparent premise underlying this argument is that SoCalGas failed to inspect and identify the 58 holes in the surface casing described above in Section III-A. However, as noted above, Blade determined the holes were most likely caused by the explosion itself. It would likely have been impossible for SoCalGas to have found these holes using any inspection techniques. With this passage in mind, please answer:

a. Please clarify which portion of the well (7-inch casing, 11 ¾ diameter surface casing, or tubing) that is being referenced by this passage.
b. Please provide a page and sentence in Blade's reports where Blade stated that SoCalGas failed to inspect and identify the 58 holes in the surface casing described above in Section III-A.

RESPONSE 3:

a. This passage relates to the 11 ¾-inch diameter surface casing.
b. SoCalGas objects to this request to the extent it mischaracterizes SoCalGas' Reply Testimony. SoCalGas' Reply Testimony stated that it was SED's premise, not Blade's, that SoCalGas failed to inspect and identify the 58 holes in the surface casing.

QUESTION 4:

On page 18, the testimony states: "There Were and Are No Tools Available to Perform the Kinds of Inspections SED Demands." With this statement in mind, please answer:

a. What exactly are the kinds of inspections that the testimony asserts that SED demands?
b. Provide all documentation, including page number reference and quote to applicable passage, supporting the answer to question 4.a.

RESPONSE 4:

a. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "SED demands," and unduly burdensome to the extent SED asks SoCalGas to identify and/or interpret SED's testimony for SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands that SED's Opening Testimony contemplates an inspection capable of assessing corrosion on the surface casing. As noted in SoCalGas' Reply Testimony, while it is unclear, SED makes a number of allegations in its Opening Testimony implicating SoCalGas' alleged failure to assess the SS-25 surface casing. See, for example, SED's Opening Testimony at 11-12:

> Blade identified a total of 58 through-wall-metal-loss holes in the 990-foot deep, 11-3/4-inch diameter steel surface casing walls of well SS-25. Fifty of the steel surface casing holes in SS-25 were identified at depths ranging between approximately 150 feet and approximately 195 feet. The

> through-wall-metal-loss holes were identified using various technologies, including caliper, UCI and HRVRT. Camera logging data were consistent with the technology logging data, with photographs matching the sensory logging tools' metal loss locations.
>
> ***
>
> In light of the extent of the corrosion on SS-25, and the resulting incident, SED considers SoCalGas's failure to investigate the specific corrosion problems on Well SS-25 its own a separate violation of California Public Utilities Code Section 451.

(Internal citations omitted). See also, SED's Opening Testimony at 25:

> Surface casing corrosion was identified in several wells where casing inspection logs were run as part of the P&A (plug and abandonment) operations. SS-25's surface casing had the worst condition; logs showed multiple through-wall holes in the 11 ¾ in. casing from approximately 134 to 300 ft. The holes in the surface casing likely contributed to the 7-inch production casing corrosion and allowed ground water and oxygen to enter the 11 ¾ inch x seven-inch annulus.

(Internal citations omitted). See also, SED's Opening Testimony at 44-45:

> Blade did not find any SoCalGas records that identified the location and nature of the groundwater in and around the SS-25 well site. Consequently, a correlation of the groundwater locations and the depth of surface casing shoes, and an assessment of the potential for surface casing corrosion were not done. The possible corrosion risks to surface casings or production casings were unknown.
>
> ***
>
> SoCalGas's failure to assess the relationship between

> groundwater in and around the SS-25 wellsite, and the surface casing corrosion of that well on SS-25 constitute a violation of Section 451.
>
> ***
>
> During the RCA Investigation Phase 3 evaluation of the condition of the 11 ¾- inch surface casing, holes in the casing were found between 134 feet and 300 feet. These holes were caused by the escaping gas pressure following external corrosion because the casing was neither fully cemented nor cathodically protected leaving the casing exposed to an environment conducive to corrosion.

(Internal citations omitted). Again, while SED's testimony on these issues is not clear, SoCalGas understood SED's position to be that SoCalGas should have inspected the surface casing in the same or similar manner to the inspections conducted by Blade during its root cause analysis.

b. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "SED demands," and unduly burdensome to the extent SED asks SoCalGas to identify support for SED's testimony to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see SoCalGas' Response to Question 4a. Also see Blade Report at 37-49 (discussing removal of the tubing and production casing) and at 118 (noting the difficulties with inspecting the surface casing even after the production casing had been removed).

<u>QUESTION 5:</u>

On pages 18 and 19, the testimony states, "The testimony from SED and Cal Advocates implies that various technologies were available which could have easily identified these holes. [Footnote omitted.] This is incorrect. Blade was able to analyze the surface casing and identify the holes only because the production casing had been cut off and extracted from the SS-25 well after the incident. Extracting the production casing exposed the surface casing for inspection and examination. During the normal operation of the SS-25 well, the production casing, of course, would have remained cemented in

the well. [Footnote omitted.]. As such, caliper logs, cameras and casing inspection logs would not have been able to evaluate the integrity of the surface casing because due to the presence of the production casing. [Footnote omitted.]. With this passage in mind, please answer:

a. Please provide the exact wording in SED and Cal Advocates' testimony that refers to "these holes" with reference to various technologies that were available for inspections.
b. If no tools are available to evaluate the integrity of the surface casing, how can SoCalGas safely operate its gas storage fields?

RESPONSE 5:

a. SoCalGas objects to this request to the extent it mischaracterizes SoCalGas' Reply Testimony. SoCalGas' Reply Testimony states that SED and Cal Advocates imply that technologies were available to discover the holes in the surface casing; it does not state that SED or Cal Advocates specifically state that technologies were available to discover the holes in the surface casing. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See SED Opening Testimony at 25, discussing SoCalGas' failure to inspect the SS-25 well casing as arising from the 1988 memo in the context of the 58 holes in the surface casing. For Cal Advocates, please see SoCalGas Reply Testimony, Chapter I, Footnote 95.

b. SoCalGas objects to this request on the basis it is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The integrity of the surface casing is a non-critical issue for the safe operation of gas storage fields. When drilling a well, the objective is not to shield the surface casing from contact with fresh-water aquifers (i.e., groundwater). The objective instead is to prevent contamination of the fresh-water aquifers from drilling fluids during the drilling of the well. Additionally, the surface casing provides no pressure barrier between the wellbore and the surrounding strata. The surface casing is not designed to contain gas within the wellbore. Therefore, after the initial drilling of the well, the integrity of the surface casing is a non-critical issue.

For example, Blade notes that the "main function of surface casing is to isolate fresh water and provide structural support for the rest of the well, and not to provide a gas tight barrier to a production string." Blade Report at 86. Further, the DOGGR regulations state only that a "[s]urface casing shall provide for control of formation fluids, for protection *of* shallow usable groundwater, and for adequate anchorage for blowout prevention equipment." Cal. Code Regs. §1935.2 (emphasis added).

Again, SoCalGas notes that Blade determined the likely cause of the holes in the surface casing was the axial rupture; the holes in the surface casing most likely did not exist prior to the incident and therefore did not provide the pathway for groundwater to access the production casing. *See* response to Question 2(b) above.

However, even if the holes in the surface casing were the pathway for groundwater to access the production casing, the integrity of the surface casing would still be a non-critical issue. If the production casing were cemented all the way to the surface, the groundwater could not have caused corrosion of the casing string. However, production casing in the SS-25 well was not cemented to surface. This is a completely separate issue from the integrity of the surface casing. While it is now required that production casing be cemented to surface, in 2015 this was not a requirement, nor was it an industry standard practice.

<u>QUESTION 6:</u>

On page 20, the testimony states, "Additionally, both the Blade Report and the SED testimony present a figure which shows the groundwater entering the annulus of the 7-inch production casing and the wellbore below the depth of the surface casing. [Footnote omitted.]. Thus, the postulated mechanism by which the groundwater accessed the annulus of the 11 ¾ inch surface casing and the 7 inch production casing is via ingress below the surface casing shoe where the production casing is not cemented and then mixing with the fluids outside the production casing which extend upwards into the annulus between the production casing and the surface casing." With this passage in mind, please answer:

a. Is it SoCalGas's contention that the "postulated mechanism" identified above is inaccurate?

b. If so:
   i. Is it SoCalGas's contention that groundwater did not access the inside of the 11 ¾ surface casing?
   ii. Is it SoCalGas's contention that groundwater did not access the 7 inch production casing?

c. If the answer to any portion of question 6b is yes, please provide the documentation in support of the answers, including page number references and quotes to the supporting passages.

RESPONSE 6:

a. No.
b.
   i. N/A.
   ii. N/A.
c. N/A.

QUESTION 7:

On page 20, the testimony states: The SS-25 well was drilled in late 1953 and early 1954 by Tidewater Associated Oil Company. At the time that Tidewater drilled the well, they would have set the 11 ¾ inch surface casing at a depth reviewed and approved by the DOGGR, which was below all known shallow groundwater sources based upon local hydrogeology.

a. Assuming the facts asserted in this passage are true, please answer:
   i. After the drilling of the SS-25 well, did SoCalGas ever check the levels of shallow groundwater sources?
   ii. If so, when?
   iii. After the drilling of the SS-25 well, did SoCalGas ever check the integrity of the cement behind the surface casing?
   iv. If so, when?
   v. Please provide the bates page numbers in the SS-25 well file that support the assertion in a.iv.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-71 DATED APRIL 9, 2020)

SOCALGAS RESPONSE DATED APRIL 21, 2020

RESPONSE 7:

a.

i. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "check." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas did not do any independent, direct testing of the levels of shallow groundwater sources after taking over the well from Tidewater.

ii. N/A.

iii. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "check." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

iv. N/A.

v. N/A.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-48 DATED DECEMBER 4, 2019

SOCALGAS RESPONSE DATED DECEMBER 19, 2019

SoCalGas provides the following Responses to the Safety Enforcement Division (SED) data request dated December 4, 2019 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

Please refer to SoCalGas Opening testimony of Mr. Dan Neville in I.19-06-016, page 3 line 27 to page 4 line 1, which states, "To evaluate the integrity of the casing body and connections, SoCalGas performed a pressure test to 3400 pounds per square inch (psi), above the maximum operating pressure of 3150 psi." With this statement in mind, please answer the following:

a. To what period of time is this statement referring?
b. By SED's calculations, the test shown above is approximately 1.08 times the

maximum operating pressure. Please confirm this is accurate. If SoCalGas disagrees with this, please provide the factor of the test above the maximum operating pressure.

c. On what date did SoCalGas pressure test the casing body and connections of well SS25 to 3400 psi?

d. Please provide the complete pressure test record showing the pressure test, including the date and psi.

e. Did SoCalGas ever exceed the stated maximum operating pressure on well SS-25?

f. If the answer to question 1h is yes, please answer:
   1. How many times?
   2. The dates and times of such times.
   3. The pressure and length of each time at which well SS-25 was operated above 3150 psi.
   4. The reason well SS-25 was operated above 3150 psi.

RESPONSE 1:

a. The pressure test occurred on May 29, 1973 during the workover to convert the well to gas storage.

b. SoCalGas objects to this request to the extent it does not seek information or documents but rather seeks to have SoCalGas confirm a mathematical calculation. SoCalGas further objects to the extent the request assumes the maximum operating pressure was applicable on May 29,1973. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The maximum operating pressure of 3150 psi was established in 2016. SoCalGas confirms the test is about 1.08 times this maximum operating pressure.

c. May 29, 1973.

d. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "complete pressure test record." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to the following electronic documents previously provided to CPUC-SED that include the SS-25 well file documents and/or well related information with Bates ranges:

   AC_CPUC_0000023 - AC_CPUC_0000759

AC_CPUC_0012338 - AC_CPUC_0012389
AC_CPUC_0206158 - AC_CPUC_0208846.

e. SoCalGas objects to this request as overly broad and unduly burdensome, and to the extent the request assumes the maximum operating pressure was applicable on or before October 23, 2015. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek information on or before October 23, 2015. Please see previously provided electronic documents with Bates Ranges:

AC_CPUC_0009479; AC_CPUC_0009485; AC_CPUC_0009492; AC_CPUC_0009498; AC_CPUC_0009504; AC_CPUC_0009510; AC_CPUC_0009516; AC_CPUC_0009522; AC_CPUC_0009528; AC_CPUC_0009540; AC_CPUC_0009546; AC_CPUC_0009552; AC_CPUC_0009558; AC_CPUC_0009564; AC_CPUC_0009570; AC_CPUC_0009576; AC_CPUC_0009582; AC_CPUC_0009588; AC_CPUC_0009594; AC_CPUC_0009600; AC_CPUC_0009606; AC_CPUC_0009612; AC_CPUC_0009618; AC_CPUC_0009624; AC_CPUC_0009630; AC_CPUC_0009679; AC_CPUC_0009680; AC_CPUC_0009683; AC_CPUC_0009687; AC_CPUC_0009688; AC_CPUC_0009691; AC_CPUC_0009695; AC_CPUC_0009696; AC_CPUC_0009700; AC_CPUC_0009704; AC_CPUC_0009708; AC_CPUC_0009712; AC_CPUC_0009713; AC_CPUC_0009716; AC_CPUC_0009717; AC_CPUC_0009720 ; AC_CPUC_0009724; AC_CPUC_0009728; AC_CPUC_0009729; AC_CPUC_0009732; AC_CPUC_0009736 ; AC_CPUC_0009737; AC_CPUC_0009740; AC_CPUC_0009744; AC_CPUC_0009748; AC_CPUC_0009749 ; AC_CPUC_0009752; AC_CPUC_0009753; AC_CPUC_0009756; AC_CPUC_0009757; AC_CPUC_0009762; AC_CPUC_0009766; AC_CPUC_0009767; AC_CPUC_0009769 ; AC_CPUC_0009771; AC_CPUC_0009772 ; AC_CPUC_0009775; AC_CPUC_0009776; AC_CPUC_0009779; AC_CPUC_0009780; AC_CPUC_0009783; AC_CPUC_0009787; AC_CPUC_0009788; AC_CPUC_0009791 ; AC_CPUC_0009793; AC_CPUC_0009794 ; AC_CPUC_0009798; AC_CPUC_0009799; AC_CPUC_0009802; AC_CPUC_0009803; AC_CPUC_0009806; AC_CPUC_0009807; AC_CPUC_0009810; AC_CPUC_0009811; AC_CPUC_0009814; AC_CPUC_0009815; AC_CPUC_0009818; AC_CPUC_0009822; AC_CPUC_0009823; AC_CPUC_0009826; AC_CPUC_0009830; AC_CPUC_0009831; AC_CPUC_0009835; AC_CPUC_0009837; AC_CPUC_0009838; AC_CPUC_0009841; AC_CPUC_0009844; AC_CPUC_0009845; AC_CPUC_0009848; AC_CPUC_0009850;

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-48 DATED DECEMBER 4, 2019

SOCALGAS RESPONSE DATED DECEMBER 19, 2019

AC_CPUC_0009852; AC_CPUC_0009854; AC_CPUC_0009856; AC_CPUC_0009858; AC_CPUC_0009860; AC_CPUC_0009862; AC_CPUC_0009864; AC_CPUC_0009866; AC_CPUC_0009868; AC_CPUC_0009870; AC_CPUC_0009872; AC_CPUC_0009874; AC_CPUC_0009876; AC_CPUC_0009878; AC_CPUC_0009880; AC_CPUC_0009882; AC_CPUC_0009884; AC_CPUC_0009886; AC_CPUC_0009888; AC_CPUC_0009890; AC_CPUC_0009892; AC_CPUC_0009894; AC_CPUC_0009896; AC_CPUC_0009898; AC_CPUC_0009900; AC_CPUC_0009902; AC_CPUC_0009904; AC_CPUC_0009906; AC_CPUC_0009908; AC_CPUC_0009910; AC_CPUC_0009912; AC_CPUC_0009914; AC_CPUC_0009916; AC_CPUC_0009918; AC_CPUC_0009920; AC_CPUC_0009922; AC_CPUC_0009924; AC_CPUC_0009926; AC_CPUC_0009928; AC_CPUC_0009930; AC_CPUC_0009932; AC_CPUC_0009936; AC_CPUC_0009938; AC_CPUC_0009940; AC_CPUC_0009942; AC_CPUC_0009944; AC_CPUC_0009946; AC_CPUC_0009948; AC_CPUC_0009950; AC_CPUC_0009952; AC_CPUC_0009954; AC_CPUC_0009956; AC_CPUC_0009958; AC_CPUC_0009960; AC_CPUC_0009962; AC_CPUC_0009964; AC_CPUC_0009966; AC_CPUC_0009968; AC_CPUC_0009970; AC_CPUC_0009972; AC_CPUC_0009974; AC_CPUC_0009976; AC_CPUC_0009978; AC_CPUC_0009980; AC_CPUC_0009982; AC_CPUC_0009984; AC_CPUC_0009986; AC_CPUC_0009988; AC_CPUC_0009990; AC_CPUC_0009992; AC_CPUC_0009994; AC_CPUC_0009996; AC_CPUC_0009998; AC_CPUC_0010000; AC_CPUC_0010002; AC_CPUC_0010004; AC_CPUC_0010006; AC_CPUC_0010008; AC_CPUC_0010010; AC_CPUC_0010012; AC_CPUC_0010014; AC_CPUC_0010016; AC_CPUC_0010018; AC_CPUC_0010020; AC_CPUC_0010022; AC_CPUC_0010026; AC_CPUC_0010028; AC_CPUC_0010030; AC_CPUC_0010032; AC_CPUC_0010034; AC_CPUC_0010036; AC_CPUC_0010038; AC_CPUC_0010040; AC_CPUC_0010042; AC_CPUC_0010044; AC_CPUC_0010045; AC_CPUC_0010048; AC_CPUC_0010052; AC_CPUC_0010054; AC_CPUC_0010056; AC_CPUC_0010058; AC_CPUC_0010060; AC_CPUC_0010074; AC_CPUC_0010078; AC_CPUC_0010079; AC_CPUC_0010084; AC_CPUC_0010091; AC_CPUC_0010096; AC_CPUC_0010097; AC_CPUC_0010108; AC_CPUC_0010109; AC_CPUC_0010114; AC_CPUC_0010115; AC_CPUC_0010126; AC_CPUC_0010127; AC_CPUC_0010131; AC_CPUC_0010136; AC_CPUC_0010137; AC_CPUC_0010143; AC_CPUC_0010144; AC_CPUC_0010157; AC_CPUC_0010167; AC_CPUC_0010175; AC_CPUC_0010176; AC_CPUC_0010177; AC_CPUC_0010186; AC_CPUC_0010187; AC_CPUC_0010188; AC_CPUC_0010196; AC_CPUC_0010197; AC_CPUC_0010208; AC_CPUC_0010209; AC_CPUC_0010211; AC_CPUC_0010218; AC_CPUC_0010221; AC_CPUC_0010222; AC_CPUC_0010223; AC_CPUC_0010228; AC_CPUC_0010229; AC_CPUC_0010232; AC_CPUC_0010233; AC_CPUC_0010248; AC_CPUC_0010249; AC_CPUC_0010252; AC_CPUC_0010261; AC_CPUC_0010262; AC_CPUC_0010270; AC_CPUC_0010271;

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-48 DATED DECEMBER 4, 2019

SOCALGAS RESPONSE DATED DECEMBER 19, 2019

AC_CPUC_0010277; AC_CPUC_0010288; AC_CPUC_0010289; AC_CPUC_0010291; AC_CPUC_0010296; AC_CPUC_0010297; AC_CPUC_0010300; AC_CPUC_0010301; AC_CPUC_0010310; AC_CPUC_0010312; AC_CPUC_0010319; AC_CPUC_0010320; AC_CPUC_0010323; AC_CPUC_0010329; AC_CPUC_0010342; AC_CPUC_0010343; AC_CPUC_0010347; AC_CPUC_0010350; AC_CPUC_0010351; AC_CPUC_0010357; AC_CPUC_0010370; AC_CPUC_0010371; AC_CPUC_0010377; AC_CPUC_0010384; AC_CPUC_0010385; AC_CPUC_0010397; AC_CPUC_0010406; AC_CPUC_0010413; AC_CPUC_0010414; AC_CPUC_0010415; AC_CPUC_0010423; AC_CPUC_0010424; AC_CPUC_0010429; AC_CPUC_0010430; AC_CPUC_0010437; AC_CPUC_0010445; AC_CPUC_0010448; AC_CPUC_0010455; AC_CPUC_0010456; AC_CPUC_0010461; AC_CPUC_0010470; AC_CPUC_0010473; AC_CPUC_0010483; AC_CPUC_0010484; AC_CPUC_0010488; AC_CPUC_0010511; AC_CPUC_0010515; AC_CPUC_0010527; AC_CPUC_0010528; AC_CPUC_0010532; AC_CPUC_0010537; AC_CPUC_0010540; AC_CPUC_0010547; AC_CPUC_0010555; AC_CPUC_0010557; AC_CPUC_0010558; AC_CPUC_0010561; AC_CPUC_0010563; AC_CPUC_0010572; AC_CPUC_0010576; AC_CPUC_0010586; AC_CPUC_0010599; AC_CPUC_0010613; AC_CPUC_0010617; AC_CPUC_0010621; AC_CPUC_0010631; AC_CPUC_0010638; AC_CPUC_0010641; AC_CPUC_0010648; AC_CPUC_0010649; AC_CPUC_0010655; AC_CPUC_0010658; AC_CPUC_0010659; AC_CPUC_0010660; AC_CPUC_0010680; AC_CPUC_0010690; AC_CPUC_0010691; AC_CPUC_0010700; AC_CPUC_0010705; AC_CPUC_0010711; AC_CPUC_0010715; AC_CPUC_0010716; AC_CPUC_0010719; AC_CPUC_0010721; AC_CPUC_0010727; AC_CPUC_0010743; AC_CPUC_0010754; AC_CPUC_0010756; AC_CPUC_0010764; AC_CPUC_0010765; AC_CPUC_0010769; AC_CPUC_0010770; AC_CPUC_0010778; AC_CPUC_0010779; AC_CPUC_0010786; AC_CPUC_0010787; AC_CPUC_0010793; AC_CPUC_0010799; AC_CPUC_0010813; AC_CPUC_0010842; AC_CPUC_0010848; AC_CPUC_0010849; AC_CPUC_0010857; AC_CPUC_0010863; AC_CPUC_0010865; AC_CPUC_0010874; AC_CPUC_0010875; AC_CPUC_0010882; AC_CPUC_0010887; AC_CPUC_0010888; AC_CPUC_0010897; AC_CPUC_0010908; AC_CPUC_0010919; AC_CPUC_0010924; AC_CPUC_0010926; AC_CPUC_0010929; AC_CPUC_0010935; AC_CPUC_0010941; AC_CPUC_0010948; AC_CPUC_0010950; AC_CPUC_0010957; AC_CPUC_0010961; AC_CPUC_0010965; AC_CPUC_0010981; AC_CPUC_0010989; AC_CPUC_0010994; AC_CPUC_0010996; AC_CPUC_0011014; AC_CPUC_0011019; AC_CPUC_0011029; AC_CPUC_0011033; AC_CPUC_0011041; AC_CPUC_0011050; AC_CPUC_0011054; AC_CPUC_0011062; AC_CPUC_0011077; AC_CPUC_0011090; AC_CPUC_0011125; AC_CPUC_0011140; AC_CPUC_0011148; AC_CPUC_0011150; AC_CPUC_0011164; AC_CPUC_0011169; AC_CPUC_0011170; AC_CPUC_0011173; AC_CPUC_0011176; AC_CPUC_0011179; AC_CPUC_0011182;

AC_CPUC_0011185; AC_CPUC_0011188; AC_CPUC_0011191; AC_CPUC_0011194; AC_CPUC_0011197; AC_CPUC_0011200; AC_CPUC_0011203; AC_CPUC_0011206; AC_CPUC_0011209; AC_CPUC_0011212; AC_CPUC_0011215; AC_CPUC_0011218; AC_CPUC_0011221; AC_CPUC_0011224; AC_CPUC_0011227; AC_CPUC_0011230; AC_CPUC_0011233; AC_CPUC_0011236; AC_CPUC_0011239; AC_CPUC_0011242; AC_CPUC_0011245; AC_CPUC_0011248; AC_CPUC_0011251; AC_CPUC_0011254; AC_CPUC_0011257; AC_CPUC_0011260; AC_CPUC_0011263; AC_CPUC_0011266; AC_CPUC_0011269; AC_CPUC_0011272; AC_CPUC_0011275; AC_CPUC_0011278; AC_CPUC_0011281; AC_CPUC_0011284; AC_CPUC_0011287; AC_CPUC_0011290; AC_CPUC_0011293; AC_CPUC_0011296; AC_CPUC_0011299; AC_CPUC_0011302; AC_CPUC_0011305; AC_CPUC_0011308; AC_CPUC_0011311; AC_CPUC_0011314; AC_CPUC_0011317; AC_CPUC_0011320; AC_CPUC_0011323; AC_CPUC_0011326; AC_CPUC_0011329; AC_CPUC_0011334; AC_CPUC_0011337; AC_CPUC_0011340; AC_CPUC_0011343; AC_CPUC_0011348; AC_CPUC_0011351; AC_CPUC_0011356; AC_CPUC_0011359; AC_CPUC_0011594; AC_CPUC_0011618.

f. SoCalGas objects to this request as overly broad and unduly burdensome, and to the extent the request assumes the maximum operating pressure was applicable on or before October 23, 2015. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek information on or before October 23, 2015. Please see Response 1e.

QUESTION 2:

Please refer to SoCalGas opening testimony of Mr. Dan Neville, page 7, lines 17 to 18, which states, "Additionally, each well was connected to a kill network of piping so that an individual well could be killed from a nearby well." With this in mind, please answer the following during the 111 day incident beginning on October 23, 2015:

a. Was well SS-25 connected to the kill network of piping referenced above?
b. If the answer to question 2a is yes, which wells were connected to well SS-25 via the kill network of piping?
c. Did SoCalGas use any of the wells identified in response to question 2b to kill well SS-25?
d. If the answer to question 2c is "no" for any of the wells connected to well

SS-25 via the kill network of piping, why did SoCalGas not use that well in an effort to kill well SS-25?

e. Has SoCalGas successfully used the kill network of piping to kill an individual well at Aliso Canyon natural gas storage facility before?
f. If the answer to question 2e is yes, provide a spreadsheet that does the following:
    i. Identify each well that was killed.
    ii. Identify each well from which the kill was made through the kill network of piping.
    iii. Identify the date each such kill was made of each well that was killed.

RESPONSE 2:

a. Yes.
b. Please see SoCalGas' response to SED Data Request 47 Response 9 dated December 13, 2019 (Bates Range: I1906016_SCG_SED_DR_47_0000581) for the remote kill network that shows connections to gas storage wells.
c. No.
d. Please see SoCalGas' response to SED Data Request 47 Response 9 dated December 13, 2019.
e. SoCalGas objects to this request to the extent it assumes the kill network can only be used to kill a well from a nearby well. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objectionx, SoCalGas responds as follows. SoCalGas interprets this request to seek information prior to October 23, 2015. Yes, on December 15, 1988, Porter 44 was killed utilizing the kill network from its well pad.
f. SoCalGas objects to this request to the extent it assumes the kill network can only be used to kill a well from a nearby well. SoCalGas further objects to this request to the extent it fails to provide time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objectionx, SoCalGas responds as follows. SoCalGas interprets this request to seek information prior to October 23, 2015. Please see Response 2e.

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SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-48 DATED DECEMBER 4, 2019

SOCALGAS RESPONSE DATED DECEMBER 19, 2019

QUESTION 3:

Please refer to SoCalGas opening testimony of Mr. Dan Neville, page 7, lines 18 to 20, which states, "Company procedures dictated that the well kill valves on the wellhead remain in the open position at all times during operations, thus maintaining remote kill ability at all times. With this in mind, please answer:

a. Provide the company procedure referenced in this passage. Be sure it is the procedure that was in place for the 111 days beginning on October 23, 2015.
b. Identify the page in this procedure that dictates what SoCalGas states in this passage.
c. Did SoCalGas follow its own procedure identified in this passage with respect to the well kill valves on SS-25?
d. If the answer to question 3c is no, what aspects of the procedure did SoCalGas not follow?
e. If the answer to question 3c is no, why did SoCalGas not follow certain aspects of this procedure?
f. Provide the records showing that the well kill valves on the SS-25 wellhead remained in the open position at all times during operations from October 1, 2015 to the end of February, 2016.

RESPONSE 3:

a. Please see the enclosed electronic documents with the following Bates Ranges: I1906016_SCG_SED_DR_48_0000001 - I1906016_SCG_SED_DR_48_0000007.
b. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "dictates." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to Section 4.2 of I1906016_SCG_SED_DR_48_0000001 - I1906016_SCG_SED_DR_48_0000007.
c. Yes.
d. N/A
e. N/A
f. SoCalGas objects to this request to the extent it assumes SoCalGas was required to keep the well kill valve in an open position at all times from October 1, 2015 through February 2016 and/or to maintain a record of the well kill valve remaining in an open position. Subject to and without waving the forgoing

objection SoCalGas responds as follows. Please see Response 3a.

QUESTION 4:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 3, lines 9 to 11, which states, "SoCalGas provided Boots & Coots personnel with information regarding the SS-25 well and the pending situation before they traveled so they were familiar with the well design on arrival and prepared to take action." With this in mind, please answer:

a. Provide the information SoCalGas provided Boots & Coots personnel regarding the SS-25 well and the pending situation before they traveled so they were familiar with the well design on arrival and prepared to take action.
b. Provide the requests Boots & Coots personnel made for information regarding the SS-25 well and the pending situation before they traveled.
c. Identify any questions from Boots & Coots personnel provided in response to question 4b that SoCalGas did not completely answer.
d. Provide the incomplete answers that were identified in response to question 4c.
e. Identify any questions from Boots & Coots personnel provided in response to question 4b that SoCalGas did not accurately answer.
f. Provide the inaccurate answers that were identified in response to question 4e.

RESPONSE 4:

a. Please refer to the following electronic documents with Bates range: I1906016_SCG_SED_DR_48_0000008 - I1906016_SCG_SED_DR_48_0000013.
b. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to Response 4a.
c. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not completely answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.
d. SoCalGas objects to this request to the extent it assumes Boots & Coots made

formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not completely answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.

e. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not accurately answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.

f. SoCalGas objects to this request to the extent it assumes Boots & Coots made formal written requests for information before they traveled to Aliso Canyon. SoCalGas objects to this request to the extent it assumes SoCalGas did not accurately answer questions from Boots & Coots. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4a.

QUESTION 5:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 6, lines 15 to 16, which states, "DOGGR's presence was significant, as the agency with the most operational expertise, and included reviewing several of the well kill plans prior to the work being performed." With this statement in mind, please answer:

a. Provide the well kill plans referenced in this statement that SoCalGas provided to DOGGR.
b. Provide the dates that SoCalGas provided these well kill plans to DOGGR

RESPONSE 5:

a. SoCalGas objects to this request to the extent it assumes SoCalGas provided the well kill plans to DOGGR. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. As described in the opening testimony of Mr. Schwecke, DOGGR was on site and reviewed several of the well kill plans. Boots and Coots well kill plans were previously provided with electronic Bates Range AC_CPUC_SED_DR_16_0000349 - AC_CPUC_SED_DR_16_0000360.
b. SoCalGas objects to this request to the extent it assumes SoCalGas provided the well kill plans to DOGGR. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See Response 5a.

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QUESTION 6:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 1, lines 12 to 14. "Out of an abundance of caution and prudence within two days of discovering the leak, SoCalGas began considering and preparing a contingency plan for a relief well in case a top well kill was not successful."

a. Please state all of the evidence SoCalGas had gathered within the first two days after the discovery of the leak that led SoCalGas to initiate plans for a relief well.
b. Provide all evidence that documents this early planning.

RESPONSE 6:

SoCalGas objects to this request as overly broad and unduly burdensome, and as vague and ambiguous, particularly with respect to the phrase "all of the evidence." SoCalGas further objects to this request to the extent it assumes SoCalGas began considering and preparing a contingency plan for a relief well based on gathered evidence. Subject to and without waving the forgoing objections SoCalGas responds as follows. SoCalGas interprets this request as seeking documentation which shows SoCalGas began considering and preparing a contingency plan for a relief well within the first two days after the discovery of the leak. Please refer to Section V of Mr. Schwecke's Opening Testimony. Please see the following electronic documents with Bates range: I1906016_SCG_SED_DR_48_0000058 - I1906016_SCG_SED_DR_48_0000059.

QUESTION 7:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 2, lines 9 through 12. "The personnel reported the unusual observation to a SoCalGas drilling manager, who instructed his drilling crew to mobilize the necessary equipment to stop the flow of gas from the reservoir, or 'kill' the well. SoCalGas crews mobilized resources, including wireline trucks, pump trucks, and vacuum trucks, which were on site or mobilized to the facility."

a. Please explain the purpose for the "kill" of each resource listed: wireline trucks, pump trucks, and vacuum trucks.
b. How long did it take to mobilize resources before everything was in place for a well kill? Was that amount of time typical for a SoCalGas well kill? If not,

what was different from others?

c. Explain how the auto-kill pipe network was or was not utilized during the first well kill.

RESPONSE 7:

a. Pump trucks pump kill fluids from storage tanks into a wellbore. Vacuum trucks load and transport kill fluid into storage tanks. Wireline refers to the cabling technology used to lower down wireline tools or measuring devices into a wellbore. A wireline unit was not mobilized or utilized for the first well kill attempt.
b. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term, "typical." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas typically mobilizes resources for planned well kills. This well kill was unplanned. Please refer to the previously provided electronic documents with Bates Range: AC_CPUC_SED_DR_16_0000649 - AC_CPUC_SED_DR_16_0000650.
c. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase, "auto-kill pipe network." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request to seek information related to the kill system. Please see SoCalGas' response to SED Data Request 47 Response 2d dated December 13, 2019.

QUESTION 8:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 2, line 31 through page 3, line 2. "While executing the procedure, SoCalGas observed fractures in the earth spreading out from the wellhead, and additional gas flow was noted through the cracks in the ground. SoCalGas personnel immediately shut down the well kill attempt and evacuated to a safe area."

a. Provide all procedures for well kills and safety procedures that SoCalGas personnel were using at the time of the SS25 well kill and identify within those procedures any instructions that address the circumstances of fractures in the earth spreading out from the wellhead and gas flow through the cracks.
b. Provide all documentation by SoCalGas personnel and its contractors of this initial event of fractures in the earth and gas flow from the fractures.

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RESPONSE 8:

a. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase, "procedures for well kills and safety procedures." Subject and notwithstanding the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request as seeking SoCalGas' formal written standards related to well kills as of October 24, 2015. Please see electronic document with Bates Range: I1906016_SCG_SED_DR_48_0000014 - I1906016_SCG_SED_DR_48_0000028.
b. SoCalGas objects to this request as overly broad and unduly burdensome. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided with electronic documents with Bates Range: AC_CPUC_SED_DR_16_0000651 - AC_CPUC_SED_DR_16_0000652.

QUESTION 9:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 3, footnote 1, last sentence: "To my knowledge, SoCalGas has required the assistance of a well control specialist on only one prior occasion that occurred in the 1970s." Provide all documentation of that well kill, including any procedures and documented "lessons learned" that resulted from that well kill event.

RESPONSE 9:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrases "all documentation" and "lessons learned." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek SoCalGas' formal written report regarding the incident at Fernando Fee 34. Please see electronic document with Bates Range: I1906016_SCG_SED_DR_48_0000029 - I1906016_SCG_SED_DR_48_0000057.

QUESTION 10:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 7, line 30 through page 8, line 2: "Also during the pendency of the leak, SoCalGas took reasonable and prudent action to implement other measures to reduce leak impacts and comply with the requests of regulators. SoCalGas ceased injection into the Aliso

Canyon storage facility and initiated withdrawals to lower reservoir pressure to support well kill efforts and reduce the amount of gas released."

a. Other than ceasing injection into the Aliso Canyon storage facility and initiating withdrawals, what reasonable and prudent actions did SoCalGas take that were actually implemented? Of those actions identified, which ones were successful and why?
b. Provide the Aliso Canyon Reservoir pressure on the date of each of the seven SS25 well kill attempts. Provide or cite to already provided records that are the source of this information.

RESPONSE 10:

a. Please refer to Section III.B.iv. of Mr. Schwecke's Opening Testimony.
b. Please see previously provided electronic documents with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 11:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 9, lines 16 to 18: ". . . when a wireline truck was required for diagnostic work, personnel had to carefully move the truck on site, install a lubricator to feed the wireline downhole, and transport and erect a crane to set the lubricator and run the wireline through the lubricator."

a. Provide documentation showing each time the wireline truck was moved onto the Well SS25 site for diagnostic work from October 23, 2015 until Well SS25 was declared sealed by DOGGR.
b. Provide all diagnostic records, including field notes and readable logs related to, or generated by, the wireline diagnostic activities.

RESPONSE 11:

a. Please refer to the previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.
b. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all diagnostic records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request to seek documentation

showing the wireline activities from October 23, 2015 through February 18, 2016. See Response 11a.

QUESTION 12:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 9, lines 28-29: "On October 25, 2015, Boots & Coots began assessing SS-25 and determined that the obstruction in the SS-25 tubing was a hydrate."

a. Explain why Boots & Coots decided the obstruction in the SS-25 tubing was a hydrate.
b. What, exactly, was the hydrate?
c. Provide all records used by Boots & Coots to make the determination that the obstruction was a hydrate.
d. Provide all records generated by Boots & Coots and the diagnostic procedures they used to make the determination that the obstruction was a hydrate.

RESPONSE 12:

SoCalGas objects to this request to the extent it does not seek information or documents but rather seeks to have SoCalGas explain the thought-process, understanding, and rational of a third party. SoCalGas further objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to the previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 13:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 11, lines 6-7: "…on November 6, 2015, Boots & Coots used the coiled tubing unit to successfully clear the hydrate from the SS-25 tubing."

a. Please explain in text how the coiled tubing unit was used to clear the hydrate from the SS-25 tubing.
b. Provide all records, including field notes and readable logs that document the use of the coiled tubing unit to clear the hydrate from the SS-25 tubing, and

the results, including any notes or tests used to confirm that it was hydrate that was blocking the SS-25 tubing.

c. Did SoCalGas or its contractors determine that there was, or was not, hydrate in the annular space between the tubing and casing of SS-25? Please explain how that determination was made and provide any records that were created that support that finding.

RESPONSE 13:

SoCalGas objects to this request to the extent it does not seek information or documents but rather seeks to have SoCalGas explain the understanding and determinations of a third party. SoCalGas further objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 14:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 12, lines 13-15:
". . . Boots& Coots was able to perform additional testing with diagnostic equipment, including temperature and noise tests through the tubing, to assess the conditions in the well."

a. Provide all records, including field notes, that document the testing and diagnostic results, including but not limited to temperature and noise tests through the tubing, to assess the conditions in the well.

b. What information was gained from the referenced testing that SoCalGas and its contractors used to design the next well kill?

RESPONSE 14:

SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

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QUESTION 15:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 12 footnote 7: "This withdrawal effort reduced the amount of gas that was released into the air."

a. What procedure did SoCalGas use for the withdrawal effort? Provide a copy of the version of the Procedure in effect on October 23, 2015 and any revisions to the procedure between October 23, 2015 and January 21, 2016.
b. Provide all records that show calculations and results that quantify the reduction of the amount of gas that was released into the air from November 11, 2015 to January 21, 2016.

RESPONSE 15:

a. Please see electronic document with Bates Range: I1906016_SCG_SED_DR_48_0000001 - I1906016_SCG_SED_DR_48_0000007.
b. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to the following link which provides the January 12, 2016 Aliso Canyon preliminary methane emissions estimates by the California Air Resources Board (CARB): https://ww3.arb.ca.gov/research/aliso_canyon/aliso_canyon_natural_gas_leak_updatessa_flights_thru_jan_12_2016.pdf?_ga=2.53068520.1705387443.1576530570-1855999613.1493842063

QUESTION 16:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 13, lines 7-8: "... first kill attempt through the coil tubing unit . . ."

a. How deep into the well did the coil tubing reach?
b. What testing or diagnostic equipment was being used during or immediately after this well kill attempt?
c. Provide all records, field notes and test results that document Boots & Coots' first well kill attempt.
d. Provide all records, field notes and test results from the first well kill attempt that document the results of Boots & Coots first well kill attempt.

RESPONSE 16:

SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 17:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 13, line 9: "Fluid pumped into the well appeared to escape into the surrounding subsurface formation."

a. What information or observations caused SoCalGas and its contractors to come to the conclusion that fluid was escaping into the surrounding subsurface formation?
b. During this kill attempt, at what depth was the fluid escaping into the surrounding subsurface formation?
c. If a depth was determined, or estimated, provide all records and data that SoCalGas and its contractors relied on to make that depth determination or estimate.

RESPONSE 17:

SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 18:

What was the bottom hole pressure used by SoCalGas and Boots & Coots to calculate the required weight of kill fluid for each of the seven well kill attempts?

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RESPONSE 18:

SoCalGas objects to this request to the extent it assumes SoCalGas calculated the required weight of kill fluid for each of the seven well kill attempts. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 19:

For well kill attempts 1 through 7, what models or standard calculations were used by SoCalGas and Boots & Coots to determine the best approach to kill the SS-25 well?

a. Provide documentation that explains the methodology for each well kill attempt.
b. Provide the calculations and results of the calculations for each well kill attempt.

RESPONSE 19:

Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 20:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 13, lines 2526: "Following each kill attempt, Boots & Coots performed diagnostic work to understand and assess the well."

a. Provide all records, including field notes, diagnostic test results and calculations generated or used by Boots & Coots to understand and assess the well.
b. For each well kill attempt, provide a text explanation of what Boots & Coots came to understand about the well after the kill attempt and how they assessed the condition of the well.

RESPONSE 20:

SoCalGas objects to this request to the extent it does not seek information or

documents but rather seeks to have SoCalGas provide an explanation of what Boots & Coots came to understand about the well after the well kill attempt and how they assessed the condition of the well. SoCalGas further objects to this request as vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

QUESTION 21:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 14, lines 6-7: "On December 22, 2015, Boots & Coots, with the assistance of the additional well kill experts and the National Laboratories, conducted the seventh top well kill attempt."

a. Provide a list of all of the experts (with their affiliations) who were involved in designing and implementing the seventh top well kill attempt.
b. Describe what was different about the seventh well kill attempt from the preceding 6 well kill attempts
c. Identify all models used by the experts identified in response to subpart a of this data request to design the seventh well kill attempt.
d. Provide all records, field notes, field monitoring, testing and diagnostics related to the planning, implementation and abandonment of the seventh SS-25 well kill attempt.

RESPONSE 21:

a. Boots & Coots ultimately designed and implemented the seventh top well kill attempt. The following consultants provided assistance during the seventh well kill attempt:

    - Don Shackelford (Sierra Hamilton)
    - John Wright (Wild Well)
    - Pete Slagel (1816 Hamilton)
    - Morton Haug Emilsen (Add Energy)
    - Jim Fox
    - James Mansdorfer

b. Please see previously provided electronic document with Bates Range:

AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.

c. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous, particularly with respect to the phrase "all records." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808.
d. Please refer to Response 21b.

QUESTION 22:

Please refer to SoCalGas opening testimony of Rodger Schwecke, page 16, lines 10-11:

"From December 15 to December 21, 2015. Boot & Coots and other contractors . . ."

a. Provide a list of all "other contractors" that drilled the relief well.
b. For each contractor identified, provide the name and title of the person(s) on site during the drilling.

RESPONSE 22:

Please see previously provided electronic document with Bates Range: AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808 and AC_CPUC_SED_DR_16_0000361 - AC_CPUC_SED_DR_16_0000648.

QUESTION 23:

Describe all of the activities that occurred at the site of Well SS-25 during the period from December 15, 2015 through February 10, 2016, identify the persons who were present at the well site during that period, and provide daily records that document all activities that occurred.

RESPONSE 23:

Please see previously provided electronic documents with Bates Range: AC_CPUC_SED_DR_16_0000361 - AC_CPUC_SED_DR_16_0000648 and AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808

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QUESTION 24:

Please refer to the Prepared Opening Testimony of Ms. Amy Kitson on Behalf of Southern California Gas Company, page 3, lines 1-14, which states,

Solution 6: Conduct a Casing Failure Analysis

This mitigation/solution has already been implemented. The Blade Report incorrectly asserts that SoCalGas did not investigate the causes of previous casing failures. In order to remediate a leak discovered in any gas storage well, SoCalGas necessarily had to analyze and diagnose the issue first, before repairing it. In describing Solution 6, the Blade Report states that "casing failures need to be formally investigated." [Footnote 3, referencing page 232 of Blade Report.] The Blade Report fails to recognize, however, that a "formal investigation" of the type Blade appears to envision would likely entail a level of examination that would not be feasible for an active well, nor necessary. While Blade was able to cut, extract, and thoroughly examine the casing at well SS-25 because there were plans to abandon the well, it is not feasible for SoCalGas to perform the same level of failure analysis on active gas storage wells. Further, although the SS-25 failure occurred at a relatively shallow depth, even Blade experienced difficulty cutting and extracting the casing. For casing failures thousands of feet belowground, operational issues may inhibit the cutting and extracting of casing.

With this passage in mind, please answer the following:

a. In stating that, "The Blade Report incorrectly asserts that SoCalGas did not investigate the causes of previous casing failures.", is it SoCalGas's point that SoCalGas did in fact investigate the causes of any previous casing failures at Aliso Canyon natural gas storage facility?

b. If the answer to question 24a is yes, please list in spreadsheet format all such previous casing failures at Aliso, which SoCalGas investigated. As part of this list, please include columns with the following information:
   1. The well that experienced the casing failure;
   2. The date or range of dates that SoCalGas investigated the casing failure;
   3. The individuals responsible for investigating the casing failure;
   4. The findings of the investigation of the casing failure;
   5. All documentation related to the investigation of the casing failure;
   6. Reference to the documents and page numbers showing the findings of

the investigation of each casing failure.

RESPONSE 24:

SoCalGas objects to this request to the extent it is overly broad, vague, ambiguous and unduly burdensome. SoCalGas further objects to this request to the extent it exceeds the scope of this proceeding as defined in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waving the forgoing objection SoCalGas responds as follows. SoCalGas assessed and addressed casing failures. SoCalGas can provide additional information regarding specific casing failures identified by SED.

Company: Southern California Gas Company (U 904 G)
Proceeding: 2016 General Rate Case
Application: A.14-11-XXX
Exhibit: SCG-06

SOCALGAS

DIRECT TESTIMONY OF PHILLIP E. BAKER

UNDERGROUND STORAGE

November, 2014

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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SUMMARY

UNDERGROUND STORAGE O&M	Thousands of 2013 Dollars		
	2013 Adjusted Recorded	TY2016 Estimated	Change
Total Non-Shared	$30,995	$40,181	$9,186
Total Shared Services (Incurred)	$0	$0	$0
Total O&M	**$30,995**	**$40,181**	**$9,186**

UNDERGROUND STORAGE CAPITAL	Thousands of 2013 Dollars		
	2014	2015	2016
Total Capital	**$71,429**	**$74,270**	**$90,523**

The funding summarized above and described in my testimony is reasonable and represents the required Operations and Maintenance (O&M) expenses and capital investments for Southern California Gas Company's (SoCalGas or the Company) underground storage facilities to:

- Maintain the safety, integrity, and effective operations of the natural gas storage system;
- Provide a reliable and economic supply of gas for customers throughout the service territory, especially during periods of high demand;
- Achieve compliance with operating and environmental regulations; and
- Allow gas deliveries to be efficiently balanced throughout the overall transmission and distribution system.

Incremental O&M and capital funding associated with a new safety, system integrity, and risk management initiative, the Storage Integrity Management Program (SIMP)**,** is proposed for underground storage wells. This program is modeled after SoCalGas' Transmission Integrity Management Program (TIMP), and a similar two-way balancing account process is requested.

The driving force behind the expenditure plan for Underground Storage is the objective of SoCalGas and its employees to provide safe, reliable deliveries of natural gas to customers at reasonable rates. O&M and capital investments also enhance and maintain the efficiency and responsiveness of operations, extend the life of assets, and facilitate compliance with governmental regulations.

The O&M forecast was established using a five-year trend, with the addition of costs for the new safety and integrity management program for underground storage wells.

The capital forecast was established using a five-year average. Added to the average are remediation costs for the new safety and well integrity management program, plus costs to drill new wells.

To understand this Test Year (TY) 2016 forecast in the proper context, the following factors should be considered:

- Storage facilities consist of large complex interconnected industrial equipment that continues to age. The increasing volume, frequency and complexity of above-ground and below-ground maintenance work, and the declining availability of replacement components for older assets exposed to demanding field conditions, all continue to push operating costs higher.

- Costs for storage activities have been increasing at a relatively consistent rate in recent years in support of safety, system integrity, maintenance, reliability, deliverability, and regulatory compliance objectives. Most increases have been driven by the intensity of traditional operating functions and routine work efforts across the board that are required to safely operate and maintain the aging infrastructure of the fields. As a result, there are very few "big ticket items" one can single out as primary contributors for the increasing O&M trend.

- Problems associated with operating equipment, aging wells, compressors, and gas and liquid process/piping systems are difficult to predict. When unpredictable failures or preemptive repair situations occur, the associated mitigation costs for such occurrences can vary from year to year. This potential for peaks and valleys in spending trends supports a longer-term (five-year) trending methodology to forecast O&M costs.

- In the future, pipeline integrity inspection requirements, the frequency and depth of regulatory audits and resulting compliance activities, additional focus on employee training, operator and supervisory qualification, employee turnover, expanded permitting and reporting requirements of regulatory agencies from new and existing environmental regulations such as storm water requirements, security enhancements, and chemical costs are all expected to increase operating expenses. These upward pressures further support the five-year trending methodology used to forecast O&M costs.

- Capital costs for routine storage functions have been relatively consistent over the past five years. This supports the five-year methodology used to forecast costs for traditional baseline capital expenditures.

- Underground storage reservoirs are dynamic geological assets where gas injection and withdrawal capabilities can change over time. These changes, which include

natural well degradation and storage volume variability due to fluid extraction or intrusion, require ongoing studies and significant capital investments in new or replacement wells to maintain historical storage deliverability rates. The small number of new or replacement wells planned, the high cost of constructing these assets, along with an inconsistent historical trend for this particular sub-activity supports a zero-based approach to forecasting the capital costs for new wells.

SOCALGAS DIRECT TESTIMONY OF PHILLIP E. BAKER
UNDERGROUND STORAGE

I. INTRODUCTION

A. Summary of Costs

I sponsor the TY2016 forecasts of O&M costs for non-shared services, and forecasts of capital costs for years 2014, 2015, and 2016, associated with Underground Storage for SoCalGas.[1] My cost forecasts support the Company's goals of maintaining and enhancing public and employee safety, as well as providing reliable supplies of gas for service delivery. Underground Storage's support of SoCalGas' safety, integrity and reliability goals is discussed in greater detail within this testimony. Tables PEB-1 and PEB-2 below summarize my sponsored costs.

Table PEB-1
Southern California Gas Company
Test Year 2016 Summary of Total O&M Costs

UNDERGROUND STORAGE O&M	Thousands of 2013 Dollars		
	2013 Adjusted Recorded	TY2016 Estimated	Change
Total Non-Shared	$30,995	$40,181	$9,186
Total Shared Services (Incurred)	$0	$0	$0
Total O&M	**$30,995**	**$40,181**	**$9,186**

Table PEB-2
Southern California Gas Company
Test Year 2016 Summary of Total Capital Costs

UNDERGROUND STORAGE CAPITAL	Thousands of 2013 Dollars		
	2014 Estimated	2015 Estimated	2016 Estimated
Total Capital	**$71,429**	**$74,270**	**$90,523**

In addition to this testimony, please also refer to my workpapers, Exhibits SCG-06-WP (O&M) and SCG-06-CWP (capital), for additional information on the activities described herein.

[1] Pursuant to CPUC Decision (D) 01-06-081, issued June 28, 2001, the costs forecast in TY2016 do not include costs associated with the operation and maintenance of the Montebello underground storage field or any costs associated with salvage operations. This decision directs that all costs associated with the Montebello underground storage field operation be removed from rates as of August 29, 2001, which has been done. Also, as of April 2009, the East Whittier storage field was removed from rate base. Therefore, costs associated with maintaining this field are also excluded from this case.

B. Summary of Activities

SoCalGas operates four underground storage fields with a combined working capacity of approximately 136 Bcf.[2] These fields are: Aliso Canyon (86.2 Bcf), La Goleta (21.5 Bcf), Honor Rancho (26.0 Bcf), and Playa del Rey (2.4 Bcf). Underground Storage is responsible for the safety, system integrity, design, operations, maintenance, and gas injection/withdrawal activities, along with environmental and regulatory compliance functions, within the four storage fields. It plans and constructs the capital investments necessary to provide value-added storage services for SoCalGas customers. The critical goals for storage are safety, system integrity, gas availability, reliability, and value, which are achieved in full compliance with governmental regulations.[3]

Gas storage fields can only be constructed in areas with unique underground geological characteristics. Their proximity to local gas consumers and transmission and distribution pipelines make them even more valuable assets. The unique underground geology of SoCalGas' storage fields, all former hydrocarbon-producing fields, and their location with respect to gas loads make them ideally suited for storage operations within the SoCalGas system. More information about what determines a good storage field is provided in Appendix B: Underground Storage of Natural Gas, and incorporated here by reference.

By their nature, gas storage fields occupy large open areas of land and require the continual installation, maintenance, refurbishment, and replacement of heavy industrial equipment such as engines, compressors, electrical systems, wells and piping, gas processing components, and instrumentation.

Natural gas is compressed onsite to very high pressures (up to 3,600 psig) and injected underground into the field reservoirs through piping networks and storage wells, typically during seasonal periods when gas consumption is low and supplies are ample.

Storage gas is usually withdrawn and delivered to customers through the transmission and distribution system when gas consumption is seasonally high during winter months. At the beginning of the withdrawal season in November, the combined storage capacity of the four storage fields is enough to supply all of SoCalGas' customers for approximately six weeks, if one assumes an average daily consumption rate.

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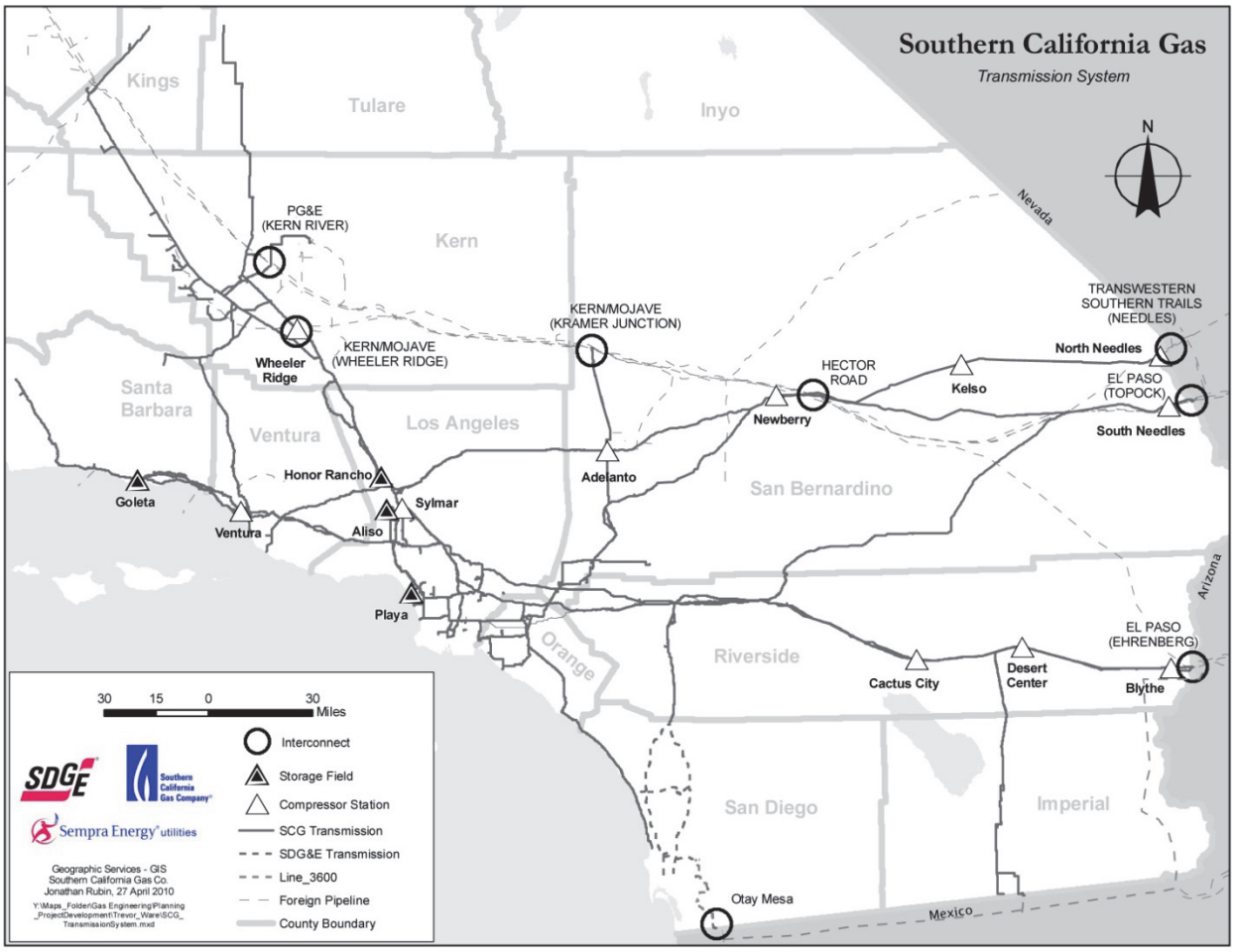
[2] The volumetric capacity of a natural gas storage field reservoir is measured in units of billion cubic feet (Bcf).

[3] Additional information on storage operations can be found in Appendix B.

A diagram/map of the SoCalGas/SDG&E gas transmission system, including the location of the four storage fields is shown in Figure PEB-1 below.

Figure PEB-1
Southern California Gas Company
Transmission and Storage System



The four storage facilities are an integrated part of the energy infrastructure required to provide southern California businesses and residents with safe and reliable energy and gas storage services at a reasonable cost.

Aliso Canyon

Aliso Canyon is located in Northern Los Angeles County and is the largest of the four gas storage fields, with a working capacity of approximately 86 Bcf and deliveries to the Los Angeles pipeline loop. Aliso Canyon began storage operations in 1973, although many of its wells date back to the 1940s. Aliso Canyon has 115 injection/withdrawal/observation wells

and is designed for a maximum withdrawal rate of approximately 1.8 Bcf per day at full-field inventory. Within the field, it is estimated there are approximately 38 miles of gas injection, withdrawal, and liquid-handling pipelines that connect the storage wells to processing and compression facilities.

Honor Rancho

Honor Rancho is also located in Northern Los Angeles County, approximately ten miles north of Aliso Canyon, with a working capacity of approximately 26 Bcf and deliveries to the Los Angeles pipeline loop. Honor Rancho began storage operations in 1975, although many of its wells date back to the 1940s. Honor Rancho has 40 gas injection/withdrawal wells and is designed for a maximum withdrawal capability of 1.0 Bcf per day. It is estimated that approximately 12 miles of pipelines connect the storage wells to processing and compression facilities.

La Goleta

La Goleta is located in Santa Barbara County near the Santa Barbara Airport and the University of California–Santa Barbara campus and provides service to the northern coastal area of the SoCalGas territory. La Goleta, the oldest of the four fields, began storage operations in 1941 and has a working capacity of approximately 21 Bcf. Most of its wells date back to the 1940s. La Goleta has 20 gas injection/withdrawal/observation wells and is designed for a maximum withdrawal capability of 0.4 Bcf per day. It is estimated that approximately eight miles of pipelines connect the storage wells to processing and compression facilities.

Playa Del Rey

Playa Del Rey, located in central Los Angeles County, near the Los Angeles International Airport, was placed into storage service in 1942. It is the smallest of the storage fields, yet, due its location, is a very critical asset with a design working capacity of approximately 2.4 Bcf. Playa Del Rey has 54 gas injection/withdrawal/observation wells. It is estimated that approximately 11 miles of pipeline connect the storage wells to processing and compression facilities.

Playa Del Rey is designed for a maximum withdrawal rate of 0.4 Bcf per day to meet residential, commercial and industrial loads throughout the western part of Los Angeles, including oil refineries and power generators.

Table PEB-3 below further summarizes the descriptive characteristics of all four storage fields.

Table PEB-3
Southern California Gas Company
Descriptive Statistics of Storage Fields

Descriptive Statistic	Aliso Canyon	La Goleta	Honor Rancho	Playa del Rey	Total All Fields
Year Field Placed in Service	1973	1941	1975	1942	-
Injection/Withdrawal/Observation Wells (number)	115	20	40	54	229
Gas Compressor Units (number)	8	8	5	3	24
Compression Horsepower (bhp)	42,000	5,700	27,500	6,000	81,000
Maximum Reservoir Pressure (psig)	3,600	2,050	4,400	1,700	-
Working Gas (Bcf)	86.2	21.5	26.0	2.4	136.1
Maximum Withdrawal Rate (MMcfd)	1,860	420	1,000	400	3,760
Maximum Injection Rate (MMcfd)	600	140	300	75	1,115
Maximum Well Depth (feet)	10,691	6,912	13,300	6,575	-
Minimum Well Depth (feet)	6,997	4,247	9,165	6,049	-
Average Well Depth (feet)	8,146	4,886	9,959	6,339	-

C. Risk Management Practices in Storage

The risk policy witnesses, Diana Day (Exhibit SCG-02) and Doug Schneider (Exhibit SCG-03), describe how risks are assessed and factored into cost decisions on an enterprise-wide basis. Several of my costs address safety risks associated with the storage system. Most specifically, I propose to establish a new SIMP, described and discussed below in the O&M and Capital cost sections, to mitigate safety-related risks.

While we have historically managed risk at our storage facilities by relying on more traditional monitoring activities and identification of potential component failures, we believe that it is critical that we adopt a more proactive and in-depth approach. Historically, safety and risk considerations for wells and their associated valves and piping components have not been addressed in past rate cases to the same extent that distribution and transmission facilities have been under the Distribution and Transmission integrity management programs. As a prudent storage operator, SoCalGas proposes to manage and approach the integrity of its storage well assets, which all fall under the jurisdiction of the California Department of Oil, Gas and Geothermal Resources (DOGGR), in a manner consistent with the approach adopted for distribution and transmission systems. Risk management activities, processes, and procedures

for well integrity should have a focus similar to those employed under the Company's pipeline risk mitigation programs.

Accordingly, in this rate case, we propose to establish a highly proactive approach to evaluating and managing risks associated with wells in our storage system through a new SIMP, modeled after the successes of our pipeline integrity management programs (TIMP and DIMP). Through the implementation of the SIMP, better storage well system data will be collected, maintained and modeled to identify the top risks throughout Storage. Comprehensive plans to mitigate those risks will be developed and implemented.

1. Risk Assessment

Currently, risk assessment of our storage system is of a qualitative nature and is based on our long experience in operating and managing SoCalGas' storage facilities. During routine system assessments, we monitor the condition of our assets and consider the risks they may pose on safety, reliability, and the environment.

The future of risk assessment for our storage system is moving towards a more robust and quantitative approach that will help us capture more information on the condition of our storage wells and develop models that will assist in prioritizing risk mitigation activities. The details of this new risk assessment are captured in further sections of my testimony describing the SIMP.

2. Risk Mitigation Alternatives Evaluation

Well risk mitigation is evaluated on a case-by-case basis. Whenever a well may pose a safety risk, we act immediately to address the problem. Alternatives, such as plugging and abandoning the well, versus a major repair or well replacement, are evaluated based on conditions, including the age of the well, prior repair or maintenance history, performance during withdrawal or injection periods, and surface considerations, such as susceptibility to landslides. These various conditions, and their associated costs, are evaluated to determine the safest, most cost-effective mitigation option. Another consideration that may influence repair decisions is the age and condition of certain well components that may have become obsolete and are no longer supported by the original equipment manufacturer and cannot be readily replaced or maintained.

At a very high level, alternatives to mitigate risks posed by deteriorating, aging, obsolete or failed storage equipment include:

- Replacement of equipment / storage wells
- Overhaul of equipment / storage wells

- Repair of equipment / storage wells
- Abandonment of a storage well / equipment
- Installation of additional equipment

3. Risk Reduction Benefits

The proposed mitigation activities are expected to address safety, reliability and environmental risks by either maintaining a certain acceptable level of control over those risks, or by further reducing the potential impacts of the risks. While there are no current means to provide a quantitative risk reduction forecast, it is my belief that the proposed mitigation activities will greatly assist in controlling and reducing the risks in our storage system.

In addition to establishing a more quantitative risk analysis of our storage wells as discussed below, the SIMP will result in a more effective prioritization of required capital expenditures that address risks that impact safety, reliability and the environment.

4. Integration of Risk Mitigation Actions and Investment Prioritization

The implementation of the proposed SIMP will establish an integrated risk management and investment prioritization process for storage management at SoCalGas. Storage wells are an integral gas delivery component, and an unanticipated safety concern could interrupt access to the working gas asset and potentially lead to a complete shutdown of a storage field.

Models to be developed from captured well data will evaluate threats and risks that exist in our storage system. This will allow for a prioritization of those storage well threats, based on their location, age, condition and other factors, thereby establishing a robust methodology for prioritizing storage management investments.

5. Investment Included in Request to Support Risk Mitigation

Investments related to the SIMP are necessary to establish a risk management program. Future mitigation activities that will result from the implementation of the SIMP will be risk-driven and will address identified and prioritized risks. SoCalGas forecasts $5.676 million annually in O&M and $24.272 million annually in capital costs for the implementation of the SIMP. It is anticipated that the SIMP will last for six years, the estimated length of time required to inspect all of the wells and mitigate any identified conditions. After this six-year period, when the program is complete, future inspection and mitigation costs will be addressed through routine operations.

D. Support To/From Other Witnesses

In addition to sponsoring my own organization's costs, I also provide sponsorship of the New Environmental Regulatory Balancing Account (NERBA) cost forecast for the reporting requirements under Subpart W for Gas Engineering, Gas Transmission and Underground Storage for witnesses Raymond Stanford (Exhibit SCG-07), John Dagg (Exhibit SCG-05), and myself. The costs associated with Subpart W reporting requirements are illustrated in the cost detail in section II.C of my testimony. Policy testimony in support of NERBA and storm water regulations is provided by Environmental Services witness Jill Tracy (Exhibit SCG-17).

II. NON-SHARED COSTS

A. Introduction

Table PEB-4 below summarizes the total non-shared O&M forecasts for the listed cost categories.

Table PEB-4
Southern California Gas Company
Non-Shared O&M Summary of Costs

UNDERGROUND STORAGE	Thousands of 2013 Dollars		
Categories of Management	**2013 Adjusted Recorded**	**TY2016 Estimated**	**Change**
Underground Storage – Routine	$30,681	$34,101	$3,420
New Environmental Regulatory Balancing Account (NERBA) (Existing Balancing Account)	$314	$404	$90
Storage Integrity Management Program (Proposed New Balancing Account)	$0	$5,676	$5,676
Total	**$30,995**	**$40,181**	**$9,186**

B. Underground Storage – Routine O&M

Table PEB-05 below summarizes the non-shared O&M forecasts for routine storage operations.

Table PEB-05
Southern California Gas Company
Non-Shared Routine O&M Costs

UNDERGROUND STORAGE	Thousands of 2013 Dollars		
Categories of Management	**2013 Adjusted Recorded**	**TY2016 Estimated**	**Change**
Underground Storage - Routine	$30,681	$34,101	$3,420

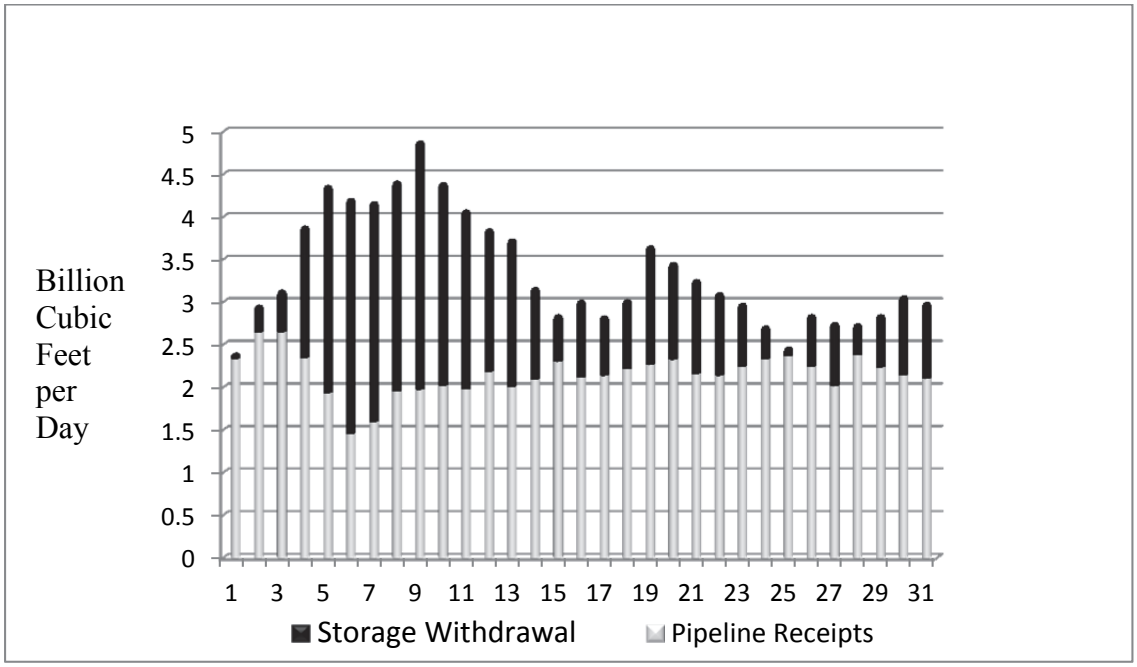
1. Criticality of Storage and Underlying Activities

The use of the four underground storage fields is an essential component of the energy delivery system within California that works in conjunction with the SoCalGas transmission pipeline and distribution delivery network. This interconnected system consists of high-pressure pipelines, compressor stations, and underground storage fields, designed to receive natural gas from interstate pipelines and local production sources. The integrated system enables deliveries of natural gas to customers or into storage field reservoirs, depending on market demands. SoCalGas uses its storage assets to efficiently meet seasonal, as well as daily, gas balancing requirements.[4] To satisfy these needs, the individual storage facilities act as "gas suppliers" or "consumers," depending upon the withdrawal or injection requirements as managed by Gas Control. Fluctuating demands may require Storage Operations to perform gas injection or withdrawal functions at any hour of the day, 365 days per year. Storage fields are continually staffed with operating crews and on-call personnel to support these critical 24/7 operations.

Figure PEB-2 below illustrates the crucial role of storage in the delivery of reliable gas service for energy consumers within southern California during the fall and winter heating season.

[4] In order to maintain operational stability of the gas system, smaller changes in supply and demand are typically met by "increasing" and/or "pulling" on the inventory of pressurized gas contained within the transmission pipelines. This process known as "packing and drafting," is an efficient way to deal with minor changes in load. As the system load increases, and can no longer be satisfied using pack and draft, the system is balanced by either injecting natural gas into the storage fields when pipeline delivery supply exceeds customer demand, or withdrawing natural gas from storage when service requirements exceeds out-of-State pipeline supplies.

Figure PEB-2
Southern California Gas Company
System Send-out December 2013



From the bar chart in Figure PEB-2, it can be observed that SoCalGas underground storage provided approximately 58% of the system send-out, or 17.7 Bcf, for a seven-day period beginning on December 5, 2013. On December 6, 2013, storage actually delivered 2.8 Bcf or 66% of the gas consumed by residential, commercial and industrial customers on this cold day. Had underground storage not been available and reliable for this extended period of high demand, widespread curtailments may have been necessary, and potentially significantly impacted millions of Southern California customers.

The reliance/dependency on underground storage to supply the SoCalGas system with such enormous volumes of gas over short period of times due to extreme weather conditions occurring locally or out of state, or from the temporary reduction of interstate supplies for other reasons, places significant strains on the wells, pipelines, and other aging storage facilities that must support the heavy withdrawal demands. The expected instant availability of storage gas requires continuous maintenance activities and ongoing investments to satisfy these immediate and longer-term customer demands.

Storage is responsible for the operation, maintenance, integrity, and engineering functions associated with the use of facilities within the perimeter of the fields. This

responsibility also extends beyond the plant perimeter in some areas, where gas injection and withdrawal pipelines and storage wells exist outside of the storage field property. As an example, Figure PEB-3 below is an aerial view of the Playa del Rey storage field that plots the location of its wells inside and outside of the plant perimeter.[5]

Figure PEB-3
Southern California Gas Company
Aerial View of Playa Del Rey Underground Storage Field

The Storage department presently consists of approximately 175 employees. It is organized with both operational and technical support groups that provide cost-effective delivery of services essential to operating and maintaining the safety, integrity, security, and reliability of its crucial gas delivery assets. While each storage field has its own unique operating issues and characteristics, there are common support activities performed on a regular basis that make up the bulk of historical expenses presented in this testimony.

In general, the activities performed in compliance with increasing regulatory requirements that drive the historical and future O&M costs for storage can be summarized as follows:

[5] Some wells are plotted on the graphic as a single dot, due to their close proximity of each other.

Management, Supervision, Training, and Engineering

These activities cover the administrative salaries and engineering costs associated with the operation of the underground storage fields. This includes funding for studies in connection with reservoir operations and wells necessary to maintain the integrity of the storage system. Leadership, safety, technical training, operator qualification and quality assurance functions are other critical components of this grouping.

Wells and Pipelines

These costs include salaries and expenses associated with routinely operating storage reservoirs such as: turning wells on and off, well testing and pressure surveys, and wellhead[6] and down-hole activities for contractors that perform subsurface leakage surveys on injection/withdrawal facilities. Other expenses include the costs associated with patrolling field lines, lubricating valves, cleaning lines, disposing of pipeline drips, injecting corrosion inhibitors, pressure monitors, and maintaining alarms and gauges.

Equipment Operation and Maintenance

These costs include salaries and expenses for maintenance work performed on gas compressors and other mechanical equipment. The work ranges from the basic repair of an oil leak to a major time consuming overhaul of a compressor engine. Other maintenance functions include: work on measurement and regulating equipment, starting and monitoring engines, lubricating machinery, environmental compliance, checking pressures, work on equipment used for conditioning extracted gas, and wastewater disposal systems. Lastly, this area includes costs for chemicals, consumables, fuel, and electrical power used to operate storage reservoirs and compressors. [7]

Structural Improvements, Rents, Royalties

These costs include salaries and expenses for maintenance work performed on compressor station structures at underground storage facilities along with property rental costs. Royalty payments associated with gas wells and land acreage located at underground storage properties is also included.

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[6] An illustrative diagram of a wellhead is provided as Appendix C, Wellhead Diagram and Down-hole Schematic.

[7] The cost of natural gas used as fuel for the compressors and other equipment necessary to operate the storage fields has been adjusted out and excluded from this testimony because these costs are included in the Triennial Cost Allocation Proceeding (TCAP). In the same manner, all unaccounted for quantities of gas associated with field operation activities are similarly excluded from this general rate case due to cost recovery in the TCAP.

Records Management

These activities are associated with maintaining records related to storage assets and operations. Typical types of work performed include: work orders, surveys and documentation of wells, pipelines, topography, roads, rights-of-way, various infrastructure and easements boundary verification, and creation and maintenance of maps related to underground zones/rights. Audit related activities are also included.

2. Cost Forecast Methodology

A five-year trending methodology using 2009 to 2013 adjusted-recorded expenses for labor and non-labor was used to forecast the TY2016 O&M for routine Storage operations, since historical O&M costs have been increasing at a relatively consistent rate. Storage facilities consist of large heavy duty equipment located above and below ground that continues to wear and age, due to operating demands and the environment. The volume of maintenance work, along with its complexity and the limited availability of replacement components, continues to push costs consistently higher on an annual basis. Increasingly stringent governmental regulations, operator qualification requirements, enhanced employee training, chemical consumables, records management functions and enhanced audit activities also contribute to the upward trend.

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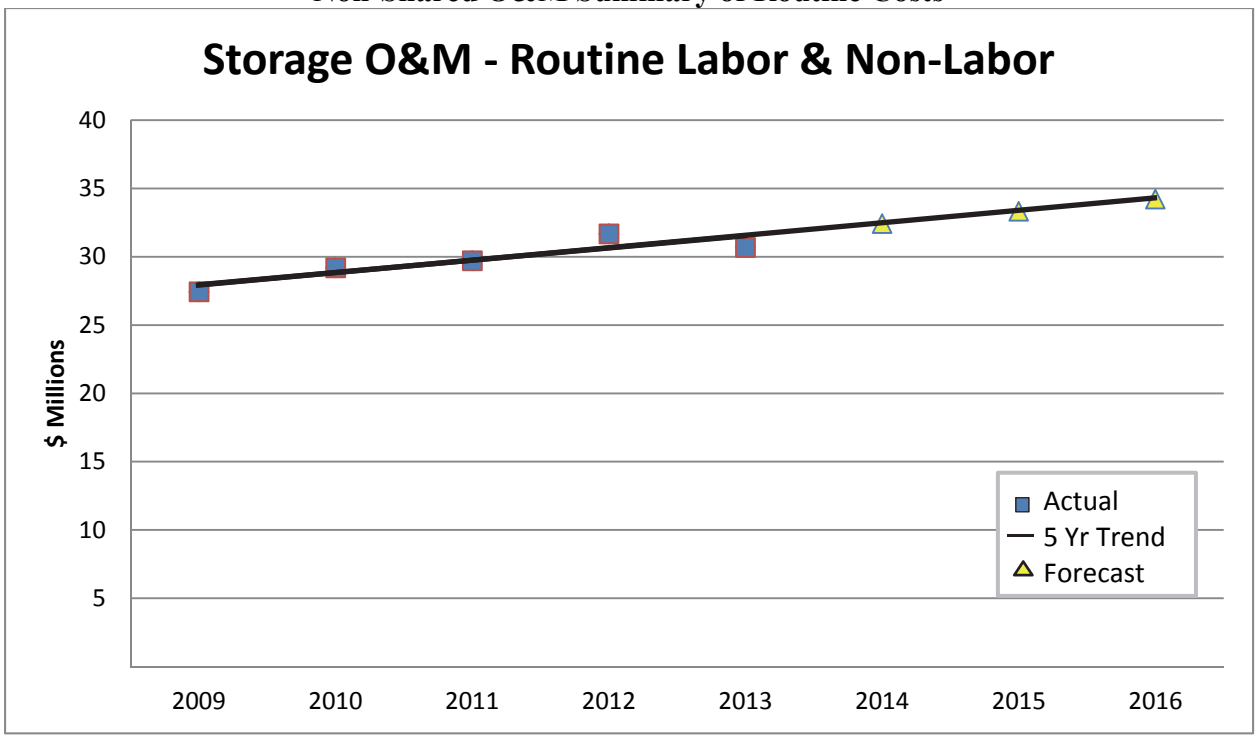
Figure PEB-4 below illustrates the historical and future projected costs (excluding NERBA and SIMP in 2016) for the routine labor and non-labor expenses based on a five-year trending methodology.

Figure PEB-4
Southern California Gas Company
Non-Shared O&M Summary of Routine Costs



The five-year trend establishes a TY2016 forecast of $34.101 million for routine O&M expenses.

3. Cost Drivers

Most increases in costs for storage over the five-year trend period are driven by the intensity of traditional operating functions and routine work efforts across the board that are required to safely operate and maintain the aging infrastructure of the fields, and costs associated with a larger volumetric storage capacity and throughput.[8]

Aging wells, compressors, and gas and liquid piping systems are susceptible to unpredictable failures or preemptive repair situations. The associated mitigation costs for such

[8] Over the five-year period of 2009 through 2013, SoCalGas increased the capacity of its storage fields by 5 Bcf, from approximately 131 Bcf to 136 Bcf. In CPUC Decision (D) 10-04-034, SoCalGas was authorized to increase the capacity of Honor Rancho from 23 to 28 Bcf. This expansion is expected to result in a total storage capacity of 138 Bcf by 2016, an inventory increase of 5.3% over 2009 volumes.

occurrences can vary from year to year. Thus, single events among relatively few facilities can have a significant impact on expense history. This "peak and valley" potential is another reason that a long-term horizon, such as the five-year historical trending methodology utilized, is appropriate for forecasting O&M costs.

In the future, pipeline integrity inspection requirements, the frequency and depth of regulatory audits and resulting compliance activities, additional focus on employee training and supervisory qualification, chemical consumables, increased permitting and reporting to regulatory agencies, along with new and existing environmental regulations are expected to add to operating expenses. Thus, O&M costs are expected to continue to increase, if not exceed, the annual historical rate of approximately 3.1%.

Another cost driver that varies from year to year is the amount of gas throughput (injection volume plus withdrawal volume) for the storage fields. This cycled volume is dependent on external factors such as the weather, the economy, and the gas markets. Over the five-year period of 2009 through 2013, the annual volume of gas cycled through the storage fields varied from a high of 228 Bcf to a low of 162 Bcf. The storage throughput in 2013 was 197 Bcf, 4% higher than the five year average of 189 Bcf. Higher gas throughput causes more wear on the compressors and equipment, and requires additional use of consumables such as engine oil, glycol, chemicals, odorant, etc.

There are few "big ticket items" one can point to as a primary cause for the increasing trend. Those few identifiable items that tend to stand out beyond the routine trend include the increasing costs of environmental compliance and hazardous waste disposal along with chemical consumables such as lubricating oil or glycol.

C. New Environmental Regulatory Balancing Account O&M Costs

The NERBA is a two-way balancing account established to record costs associated with specified new and proposed environmental regulations. Table PEB-6 below summarizes the costs for Storage, Transmission and Gas Engineering that are balanced in the NERBA.

Table PEB-6
Southern California Gas Company
NERBA Costs for Storage, Transmission and Gas Engineering

UNDERGROUND STORAGE	Thousands of 2013 Dollars		
Categories of Management	**2013 Adjusted Recorded**	**TY2016 Estimated**	**Change**
New Environmental Regulatory Balancing Account (NERBA)	$314	$404	$90

1. Description of Costs and Underlying Activities

The NERBA costs in my testimony are limited to the Environmental Protection Agency Subpart W reporting requirement costs for Gas Engineering, Gas Transmission, and Underground Storage. This forecast is to comply with the Subpart W requirements for fugitive emission monitoring, as supported by Environmental Services witness Jill Tracy (Exhibit SCG-17), that address facilities downstream of major equipment, such as compressors, regulator stations, and valves.

2. Cost Forecast Method

The forecast method for this cost category is the base year plus anticipated incremental costs. This method is appropriate because it identifies specific environmental regulatory changes and their related costs impacting the company in 2013, and during the next forecast period that cannot be represented using an average or trending forecast. Due to the uncertainty of the scope and anticipated costs related to future reporting, incremental funding was added to the base year recorded costs.

3. Cost Drivers

The cost drivers behind this forecast are the anticipated upper pressures from air quality agencies requiring more emission reporting during the next forecast period.

D. Storage Integrity Management Program

SoCalGas proposes to implement a new SIMP to proactively identify and mitigate potential storage well safety and/or integrity issues before they result in unsafe conditions for the public or employees. Table PEB-7 below summarizes the projected O&M costs for implementation of the SIMP.

Table PEB-7
Southern California Gas Company
Storage Integrity Management Program O&M Costs

UNDERGROUND STORAGE	Thousands of 2013 Dollars		
Categories of Management	**2013 Adjusted Recorded**	**TY2016 Estimated**	**Change**
Storage Integrity Management Program (SIMP)	$0	$5,676	$5,676

1. Introduction

SoCalGas proposes to implement a new six-year SIMP to proactively identify and mitigate potential storage well safety and/or integrity issues before they result in unsafe conditions for the public or employees. A proactive, methodical, and structured approach, using state-of-the-art inspection technologies and risk management disciplines to address well integrity issues before they result in unsafe conditions, or become major situational or media incidents, is a prudent operating practice. Without a robust program to inspect underground storage wells to identify potential safety and/or integrity issues, problems may remain undetected within the high pressure above-ground wellheads, pipe laterals (up to 3,600 psig) and below-ground facilities (up to 4,400 psig) among the 229 storage field wells. This situation is evidenced by an increase in recent years in the type of work related to safety conditions observed as part of routine operations. This concern is further amplified by the age, length, and location of wells. Some SoCalGas wells are more than 80 years old with an average age of 52 years. Well depths can exceed 13,000 feet. In addition, some wells are located within close proximity to residential dwellings or high consequence areas, as shown in Figure PEB-3.

The SIMP is intended to:

- Identify threats and perform risk assessment for all wells
- Develop an assessment plan for all wells
- Remediate conditions
- Develop preventative and mitigation measures
- Maintain associated records

The primary threats to the SoCalGas well facilities that SIMP will address are internal and external corrosion, and erosion.[9] Once an issue is identified, the initiation of critical repair work identified will immediately minimize safety risks. Lesser-risk integrity work will be prioritized to plan and efficiently execute mitigation or preventative actions.

SoCalGas proposes to establish detailed baseline assessments on its underground assets that are complete, verifiable, and traceable to a much greater degree than it has done in the past.[10] This risk management approach will enhance the proactive assessment, management, planning, repair, and replacement of below-ground facilities to eliminate situations that could potentially expose the public or employees to uncontrolled well-related situations.

The SIMP would launch an accelerated and robust assessment of the inspected storage well facilities (approximately 50% of the SoCalGas wells) over the rate case period. The initial SIMP work, which will likely target wells older than fifty years of age, would enhance ongoing safety, system integrity, support reliability of service, and provide additional confidence that wells, down-hole equipment, and associated pipe laterals maintain their compliance with DOGGR regulations. While SoCalGas currently meets existing requirements under DOGGR regulations, the possibility of a well related incident still exists, given the age of the wells and their heavy utilization. A SIMP will further decrease risks always present in these types of operations, provide a higher level of safety for its customers and employees, and further protect the environment.

Presently, most major O&M and capital funded activities conducted on storage wells are typically reactive-type work, in response to corrosion or other problems identified through routine pressure surveillance and temperature surveys. For example in 2008 at Aliso Canyon, it was discovered during routine weekly pressure surveillance that the surface annulus of well Porter 50A had a pressure of over 400 psig.[11] In most cases, situations like this can be indicative of production casing leaks from either internal or external corrosion where high pressure gas can

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[9] The gas withdrawn from storage formations typically contains water, sand, and reactive gas constituents such as carbon dioxide that can corrode or erode storage well components especially during periods of high demand.

[10] The goals and objectives of SIMP are similar to those of the TIMP for transmission pipelines. SIMP would be focused on vertical casing pipe and components (wells) and associated above-ground facilities.

[11] The well was immediately taken out of service and work began to isolate and blow-down the surface casing. Eventually a workover rig moved onto the well and an ultrasonic inspection revealed external production casing corrosion from 450 ft. to 1050 ft.

migrate to the surface in a matter of hours. External corrosion has also been observed in other wells at the field.

Routine surveillance and temperature survey work identifies problems that have already occurred, and well integrity may have already been severely compromised requiring immediate attention to maintain safety, integrity and reliability. For example in 2013, again at Aliso Canyon, two wells were found to have leaks in the production casing at depths adjacent to the shallower oil production sands. In these situations, there was no evidence of the leaks at the surface or surface casing.

Reactive-type work in response to identified safety-related conditions observed as part of routine operations has increased in recent years. In fact, a negative well integrity trend seems to have developed since 2008. The increasing number of safety and integrity conditions summarized in Table PEB-8 below is attributed primarily to the frequency of use, exposure to the environment, and length of time the wells have been in service.

Table PEB-8
Southern California Gas Company
Number of Major Well Integrity Workovers by Year

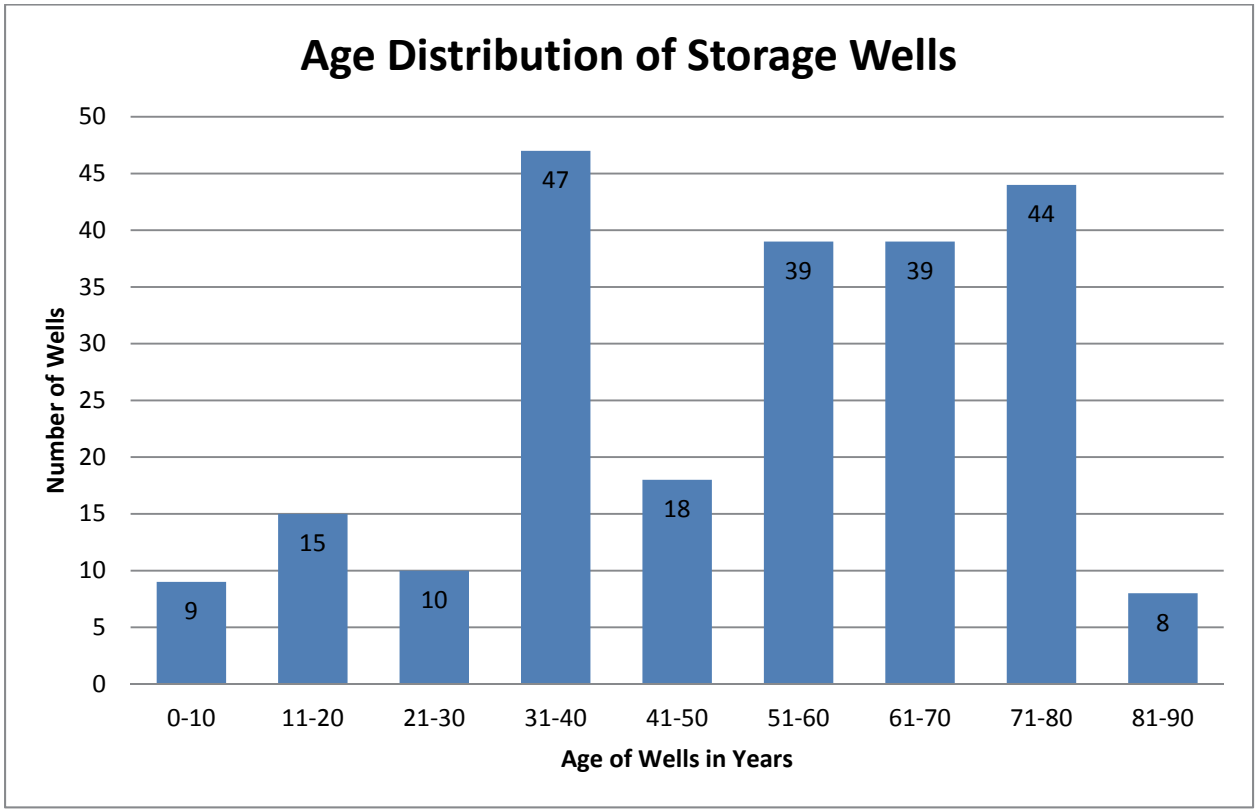
Well Integrity Category	Year					
	2008	2009	2010	2011	2012	2013
Casing Leak	-	-	-	2	3	2
Tubing Leak	1	1	5	3	3	4
Wellhead Leak	-	-	1	2	-	2
Casing Shoe Leak	-	1	-	1	-	-
Sub-surface Safety Valve	2	-	-	-	2	1
Total	3	2	6	8	8	9

Ultrasonic surveys conducted in storage wells as part of well repair work from 2008 to 2013 identified internal/external casing corrosion, or mechanical damage in 15 wells. External casing corrosion has been observed at relatively shallow depths in the production casing, and at deeper intervals near the Aliso Canyon shallow oil production zone at which is being water-flooded. Internal mechanical wear has been observed in production casings, likely as a result of drilling operations that took place when the well was originally drilled. In addition, external

tubing corrosion has been observed on tubing in the joint above the packer most likely as a result of stagnant fluid.

In addition to the 36 well-related conditions presented in Table 8, and the corrosion or mechanically damaged wells that were previously identified, SoCalGas has 52 storage wells in service that are more than 70 years old. Half of the 229 storage wells are more than 57 years old as of July 2014. Figure PEB-5 below displays the age distribution visually.

Figure PEB-5
Southern California Gas Company
Age Distribution of Storage Wells



Given the increasing trend in well integrity repairs, the corrosion threats that have been detected on some wells, the increasing age of the wells, and the success of the California Public Utilities Commission (CPUC)-approved TIMP, which has been established to maintain the safety of horizontal high pressure pipelines that are subject to less harsh conditions than storage wells, the SIMP is certainly justified. Without the SIMP, SoCalGas will continue to operate in a reactive mode (with the potential for even higher costs to ratepayers) to address sudden failures

of old equipment. In addition, SoCalGas and customers could experience major failures and service interruptions from potential hazards that currently remain undetected.

Some of the inspection techniques, components, and practices planned for the SIMP are currently conducted on a limited basis as part of on-going operations performed to address maintenance issues. The intensity of routine inspections is expected to continue at historical levels. The more advanced SIMP inspections will be performed in addition to routine reactive inspections, as there is currently no indication that the rate of reactive maintenance work will decrease over the period of the next rate case. By establishing the additional and more robust SIMP inspections, and creating baseline assessments of well conditions, the severity and extent of reactive maintenance may be reduced in the future, and the time necessary to respond to indications of breaches in reservoir integrity and safety should be greatly improved.

To take advantage of economy of scale, accelerate problem solving and knowledge continuity, and best utilize the limited resources of qualified personnel and specialized equipment in the oil and gas industry required for this type of program, SoCalGas plans to conduct this program over a six-year period. Economic rig availability and quality supervision is highly dependent on overall demands of the industry. A continuous program implemented over a reasonable period of time will help secure efficient and effective specialty resources. After the six-year baseline assessment period of the SIMP, it is expected that well assessments performed on a regular frequency would become part of routine operations.

SoCalGas proposes that these O&M costs receive two-way balancing treatment due to the highly unpredictable nature of inspection costs. Factors contributing to the uncertainty include the unknown number of at-risk wells and their integrity status, the highly variable nature of well inspection strategies, the uncertainty surrounding the volume and degree of repair work to be performed, the variable cost of consulting experts when required, specialty equipment and skillful operators to be procured, and erratic field conditions typically encountered once inspection work is initiated. Since there are many uncertainties with regards to the number and integrity condition of the wells, and down hole inspection activities can become enormously costly and unpredictable when problems occur which is increasingly frequent, and follow-up mitigation actions whether they be O&M or capital is so variable due to the unique situation of each well, a two-way interest bearing balancing account treatment is requested for this work as sponsored by Regulatory Accounts witness Reginald Austria (Exhibit SCG-35).

2. General Description of Work

The safety and integrity-related work will be conducted in parallel at all four Storage Fields (Aliso Canyon, Honor Rancho, Playa del Rey, and La Goleta). A project manager, with other support personnel, will be used to conduct detailed internal well inspections and to develop the threat identification, risk assessment, well assessment plan, plan to remediate the conditions found, preventive and mitigative measures, and record keeping requirements for the SIMP. The assessment portion of the process will include contract workover rigs that will be used to evaluate downhole casing and tubing. Surface equipment such as valves, wellheads, and well laterals will be evaluated using different methods.

A threat assessment and risk assessment matrix will be developed and populated, and a priority inspection guide established, from existing well data that includes but is not limited to: age of the well, proximity to sensitive areas or populations, workover history, inspection data, historical withdrawal rates (energy release potential), known reservoir and geologic conditions, and surrounding geological characteristics (fault lines, landslide potential, etc.). In summary, it is expected that the oldest wells in closest proximity to the public, located in environmentally or safety-sensitive areas that have not had recent downhole inspections or work would likely be prioritized for inspection. Other wells may be added to this list, where deemed appropriate, based on subject matter expertise.

The first order of work would include the detailed inspection of all surface valves and above ground lines on the wellheads and laterals (both kill and injection/withdrawal lines), since surface failures, should they occur, could potentially have the most immediate impact on operating personnel and the public.

The majority of O&M costs to perform the noise and temperature surveys, pressure tests, visual camera tests, and casing/tubing inspections to assess well integrity risks associated with internal/external corrosion and erosion are associated with workover rig usage and well control activities. A typical week-long inspection process is summarized at a high level with the following ten steps:

1. Move in the workover rig and fill the well with brine.
2. Install well Blow-out Prevention Equipment.
3. Remove the tubing and down-hole completion equipment.
4. Scrape and prepare the casing, set the bridge plug and sand.

5. Run casing inspection equipment (Ultrasonic, magnetic flux, calipers, cameras etc.).
6. Run the test packer and pressure test production casing.
7. Remove the sand and retrievable bridge plug.
8. Re-install the production tubing and completion equipment, then pressure test.
9. Rig down the Blow-out Prevention Equipment, reinstall the production tree, and move the workover rig off the well.
10. Replace laterals, instrumentation, unload the workover brine from the wellbore and return the well to service.

This type of inspection operation typically requires six to eight days to complete, assuming no difficulties are encountered. If difficulties are encountered, which are not unusual with well work, the duration of the inspection and associated costs could easily double.

Follow-up preventative mitigation and remediation work will most likely be capitalized. The remediation plan will depend on the evaluation of the inspection data, and further pressure testing of the casing may be conducted. If no damage is observed or questionable conditions identified, the tubing will be re-run, the wellheads and laterals reinstalled, and the well will be returned to normal operations. If any significant deficiencies or unacceptable operating situations are found during the evaluation, the well will not be returned to service. Rather, it will be idled for an indefinite period of time while a detailed work prognosis is prepared and further work scheduled. Preventative and mitigative measures could include actions such as running inner liners, new tubing, cement squeezing of holes, or possible abandonment of the well. A complete abandonment would likely require the drilling of a replacement well in order to maintain storage field deliverability requirements. The details of the SIMP capital plan are included in section III-C.C13 of this testimony.

The record keeping requirements will include a written Storage Integrity Management Plan, traceable, verifiable and complete documentation of the results of the assessments that are completed, and the results of the remediation completed.

The company labor required for the inspection process is one individual at each of the four fields to oversee the workover/inspection contractors, plus 1.5 FTEs to manage the inspection program, interpret the complex data, and develop follow-up mitigation plans.

3. Cost Forecast Methodology

The forecast method used for SIMP O&M activities is zero-based. This approach is most appropriate because this is a new program and the assumed units of work, estimated cost per unit, and support labor needs are identifiable. Unit costs for the ten step inspection process previously described and the lateral inspections are based on historical prices of similar type work. Labor FTEs to support the program based on experience and practicality consist of one Contract Administrator for each of the fields (4), a Well Inspection Project Manager (1), and 0.5 clerical support. These costs are presented in Table PEB-9 below.

Table PEB-9
Southern California Gas Company
SIMP O&M Cost Detail

Description	Annual Number	Cost Per Inspection	Estimated Total
		(Thousands of $2003)	
Well Inspections and Mitigation	40	$390	$15,600
Lateral Piping Inspections	40	$5	$200
Company Labor FTEs	5.5	N/A	$812
Well Inspection Costs Reassigned to Capital	N/A	N/A	($10,936)
Total O&M	-	-	$5,676

4. Cost Drivers

The most significant cost drivers for this uniquely specialized work performed on high pressure wells is the availability of workover rigs, the skilled field and technical workforce required to produce and analyze data, and the specialized equipment to be employed.

III. CAPITAL COSTS

A. Introduction

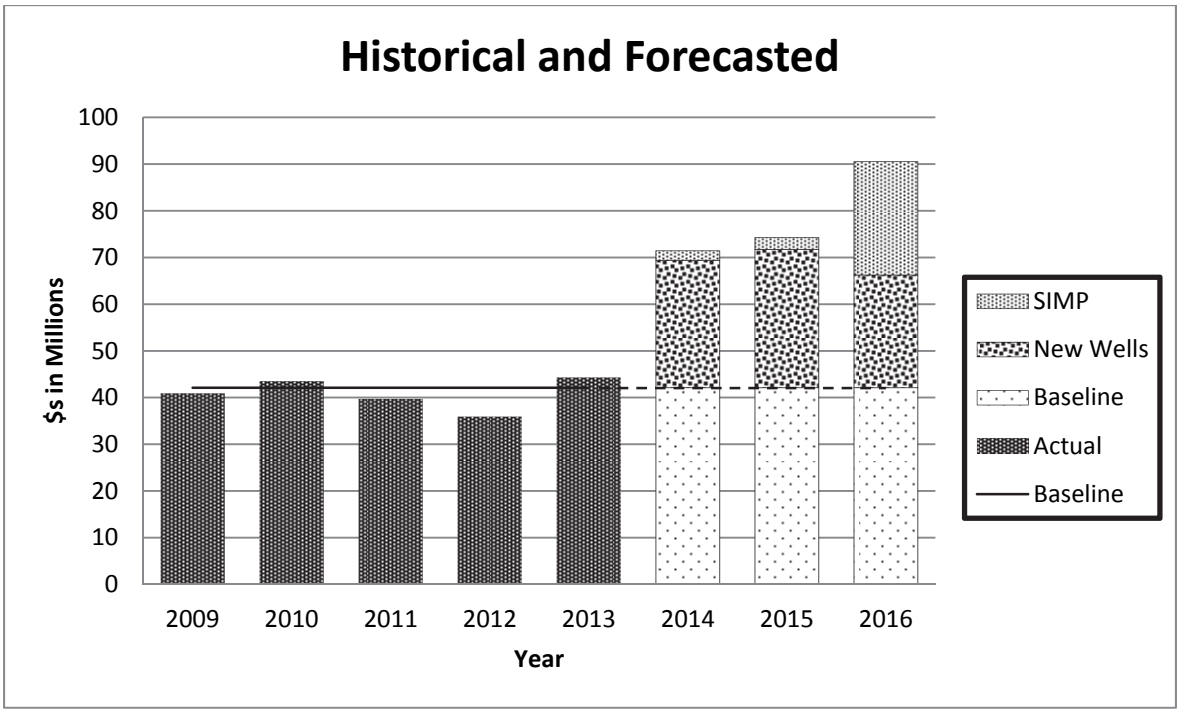
The costs described in this section cover the capital expenditures estimated for Storage operations. The intent behind the capital expenditure plan is to provide safe, reliable delivery of natural gas to customers at the lowest reasonable cost. These investments also enhance the integrity, efficiency, and responsiveness of operations while maintaining compliance with applicable regulatory and environmental regulations. Table PEB-10 below summarizes the total capital forecasts for Gas Storage for 2014, 2015, and 2016.

Table PEB-10
Southern California Gas Company
Capital Expenditures Summary of Costs
(Thousands of $2013)

Category Description	2013 Recorded	2014 Estimated	2015 Estimated	2016 Estimated
Storage Compressors	$8,991	$7,790	$7,790	$7,790
Storage Wells	$10,976	$31,890	$34,360	$36,977
Storage Integrity Management Program	$0	$2,008	$2,510	$24,272
Storage Pipelines	$4,005	$6,546	$10,083	$4,931
Storage Purification Systems	$9,284	$8,796	$7,605	$7,605
Storage Auxiliary Systems	$11,058	$14,398	$11,922	$8,948
Total Capital:	**$44,313**	**$71,429**	**$74,270**	**$90,523**

Figure PEB-6 below presents the Total Capital summary of Table PEB-10 in a graphical format.

Figure PEB-6
Southern California Gas Company
Historical and Forecasted Total Capital by Year



The 2016 capital request of $90.523 million was derived using the following methodology:

- Summation of five-year averages to create a baseline estimate for routine functions.
- Plus, incremental costs to drill new wells at a level that began in 2014 to address natural deliverability declines.
- Plus SIMP.

As noted previously, SoCalGas seeks two-way balancing treatment of the SIMP capital cost estimates. Additional detail on the categories and costs that comprise the total capital forecast is presented in the sections below.

B. Storage Compressors

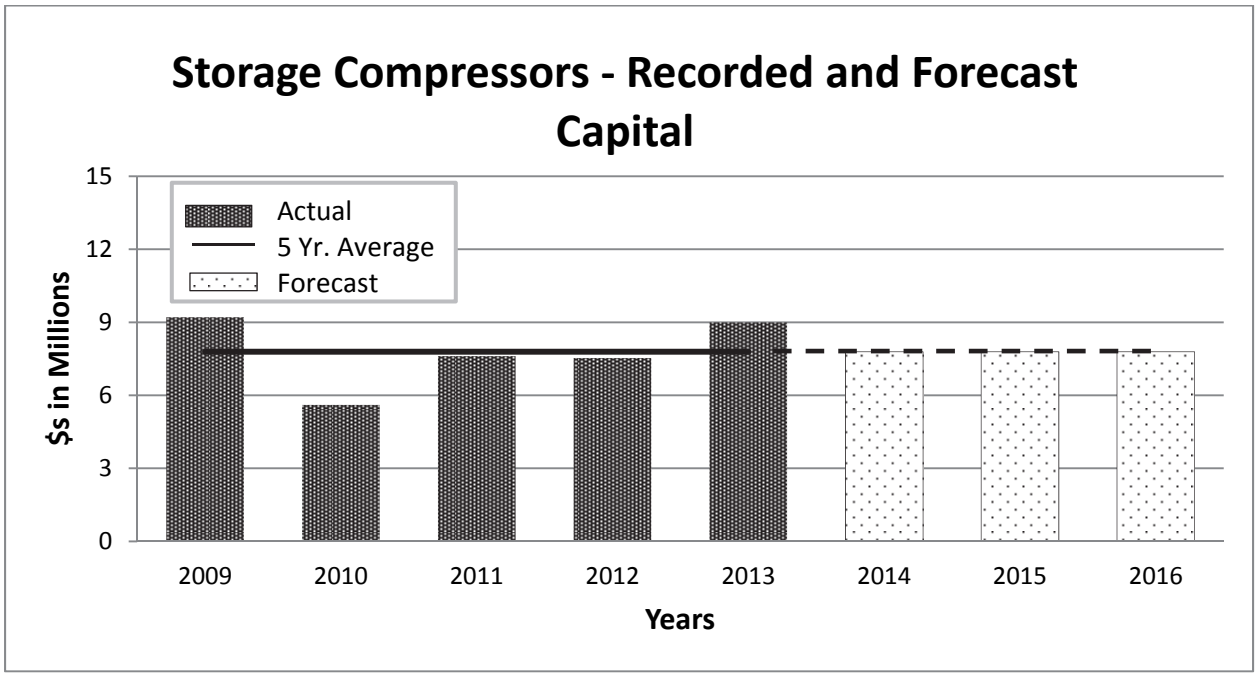
This Budget Category includes costs associated with natural gas compressors. These storage compressor units increase the pressure of natural gas so it can be injected into the underground reservoirs. Examples of equipment within this area include turbines, engines, high-pressure gas compressors, compressed air system equipment, fire suppression systems, gas scrubbers, and related control instruments. This budget category includes the necessary capital for maintenance, replacements, and upgrades of the various storage field compressors to uphold safety, maintain or improve reliability, extend equipment life, achieve environmental compliance, and to meet the required injection capacities. Table PEB-11 below summarizes the cost forecast for storage compressors.

Table PEB-11
Southern California Gas Company
Capital Expenditures for Storage Compressors

STORAGE COMPRESSORS	Thousands of 2013 Dollars		
	Estimated 2014	Estimated 2015	Estimated 2016
B1- Goleta Units #2 and #3 Overhauls	$253	$2,272	$0
B2- Blanket Projects	$7,538	$5,518	$7.790
Total	**$7,791**	**$7,790**	**$7,790**

Due to the annual variability of this category, a five year average was used to develop the 2016 estimate, as presented in Figure PEB-7 below. Projects expected to cost over $1 million are supported by individual capital workpapers that accompany this testimony, Exhibit SCG-CWP.

Figure PEB-7
Southern California Gas Company
Historical and Forecasted Storage Compressor Capital



1. B1-Goleta Units #2 and #3 Overhauls

a. Description

When compressors reach the end of their service lives, they must be overhauled in order to avoid replacing them in-kind. Overhauls are necessary for safety, to restore and/or maintain their efficiency, deliver capacity, maintain compliance with environmental regulations and provide reliable service. While parts and compressor service contractors are still available, an overhaul is typically the most cost-effective solution. Goleta Units #2 and #3 have reached their maximum in-service time and require overhauls in order to maintain safety, efficiency, reliability, and environmental compliance. The overhaul of units #2 and #3 at Goleta is expected to cost $253K, $2.272 million, and $0 in 2014, 2015, and 2016, respectively. Specific details regarding the overhauls may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Costs are based on the knowledge of experienced personnel who have handled similar overhauls in the recent past. Such experience is based on recent costs of component parts and quotes by qualified contractors.

c. Cost Drivers

The cost drivers for these capital projects relate to the very specific skill sets, tooling, parts, and specialized knowledge for gas engines, equipment, and the high pressure natural gas compressors they power.

2. B2-Blanket Projects

a. Description

Compressor Station equipment must have continuing capital maintenance as items continue to age and to wear out. SoCalGas plans to replace and upgrade aging and obsolete compressor equipment via smaller projects with individual costs estimates that do not justify the preparation of individual workpapers. These projects are addressed as "Blanket" projects and cost estimates vary from tens of thousands to several hundred thousands of dollars. Projected work includes, but is not limited to overhauls, rebuilds, major equipment replacements and upgrades to critical assets such as power turbines, gear boxes, compressors, and engines. Deferral of these smaller compressor maintenance projects could jeopardize safety or cause equipment to shut down, which can threaten supply continuity. Forecast capital costs for Blanket projects in $ millions for 2014, 2015, and 2016 are $7.538, $5.518, and $7.790, respectively.

b. Forecast Method

This estimate is based on the local knowledge and judgment of the managers at the storage fields, and the historical conditions at each field that routinely need correcting through blanket capital projects.

c. Cost Drivers

The underlying cost drivers for Blanket projects relate to equipment type and complexity, operating location, availability of qualified contractors, and workload. There are a limited number of qualified contractors available for compressor work in Southern California, and they perform work for customers other than SoCalGas. Thus, prices for these specialized services vary based on contractor workload and associated equipment lead times. Parts and equipment costs are driven by the limited number of competing suppliers and the very specialized nature of the hardware.

C. Storage Wells

This Budget Category includes costs associated with replacing failed components on existing wells, and the design, drilling and completion of replacement wells for the injection and

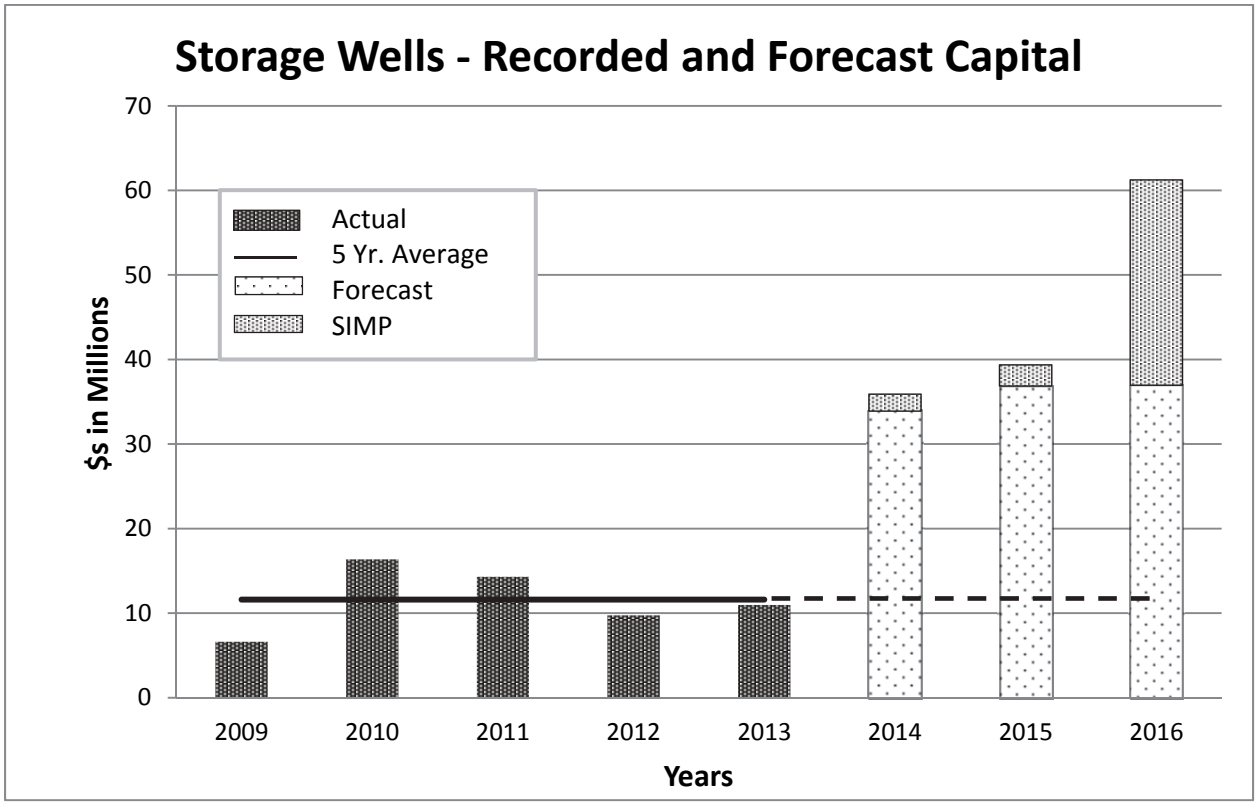
withdrawal of natural gas and reservoir observation purposes. This includes well workover contractors (major well work), drilling contractors, and component materials such as tubing, casing, valves, pumps, and other down-hole equipment. Table PEB-12 below summarizes the capital cost forecast for this Budget Category.

Table PEB-12
Southern California Gas Company
Capital Expenditures for Storage Wells

STORAGE WELLS	Thousands of 2013 Dollars		
	Estimated 2014	**Estimated 2015**	**Estimated 2016**
C1- Wellhead Valve Replacements	$1,194	$1,194	$1,194
C2- Well Tubing Replacements	$4,041	$4,041	$4,041
C3- Wellhead Leak Repairs	$1,807	$1,807	$1,807
C4- Well Inner-string Installations	$1,707	$1,707	$1,707
C5- Submersible Pump Installations	$552	$552	$552
C6- Well Stimulations	$176	$176	$176
C7- Well Gravel Packs	$3,715	$3,715	$3,715
C8- Well Re-drills	$2,209	$2,008	$0
C9- Replacement Wells	$10,241	$10,442	$18,273
C10- Plug and Abandon Wells	$3,876	$6,195	$4,688
C11- Blanket Projects	$974	$1,125	$824
C12- Cushion Gas Purchase	$1,398	$1,398	$0
C13- SIMP	$2,008	$2,510	$24,272
Total	**$33,898**	**$36,870**	**$61,249**

Figure PEB-8 below illustrates the combined Wells and SIMP capital forecasts from Table PEB-12 in a graphical format.

Figure PEB-8
Southern California Gas Company
Historical and Forecasted Wells Capital



The Storage Wells category in this testimony is further described using the following sub-sections:

- C1-Wellhead Valve Replacements
- C2-Well Tubing Replacements
- C3-Wellhead Leak Repairs
- C4-Well Inner-string Installations
- C5-Submersible Pump Replacements
- C6-Well stimulations
- C7-Well Gravel Packs
- C8-Well Re-drills
- C9-Well Replacements

- C10-Well Plug and Abandonments
- C11-Storage Blanket Projects
- C12-Cushion Gas Purchase
- C13-Storage Integrity Management Program (SIMP)

1. C1-Wellhead Valve Replacements

a. Description

SoCalGas plans to replace and upgrade gas-passing, aging, and obsolete wellhead valves located throughout the four storage fields. This work is necessary due to obsolete and gas-passing wellhead valves, some of which have been in service more than fifty years. Gas-passing wellhead valves can create a safety, operating or environmental hazard if not replaced in a timely manner. Costs in $ millions for 2014, 2015, and 2016 are forecast to be $1.194, $1.194, and $1.194, respectively. The specific details regarding wellhead valve replacements identified as part of routine operations are found in my capital workpapers, Exhibit PEB-06-CWP. An illustrative diagram of a wellhead is provided as Appendix C, Wellhead Diagram and Downhole Schematic.

b. Forecast Method

Historically, there have been twelve to fifteen wellhead valve replacement projects per year at an approximate cost of $85k each. Fourteen projects are planned in 2016. Costs include the material and services required to secure the well, replace the wellhead valves, and return the well to service.

c. Cost Drivers

The cost drivers for wellhead valves are the purchase price of the valves and the installation contracting services. Wellheads must be isolated from reservoir pressure and depressurized in order to replace the principal valve. This is a complex operation that requires controlling well pressures that can reach 3,600 psig.

2. C2-Well Tubing Replacements

a. Description

Continuous tubing replacements are required among the existing 229 aging wells throughout the storage fields. Tubing replacements are necessary to maintain aging well equipment when they have reached the end of their useful life. Leaking tubing strings can become a safety or environmental hazards if not replaced in a timely manner. Costs in $ millions

for such work are estimated to be $4.041, $4.041, and $4.041, for 2014, 2015, and 2016 respectively. The estimated costs of the replacement projects include the tubing commodity purchase, all of the activities involved to secure the wells, the equipment and well services required for tubing removal, and the reinstallation operations. Specific details regarding tubing replacements identified as part of routine operations are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

There are seven workover rig tubing replacement projects estimated per year at an approximate cost of $575k each. Costs include the material and services required to secure the well, replace the tubing, valve work, and returning the well to service.

c. Cost Drivers

Cost of these replacements is driven by the very specific nature and characteristics of high pressure injection wells. This is a complex operation that requires controlling well pressures which can reach 3,600 psig.

3. C3-Wellhead Leak Repairs

a. Description

Wellhead leak repairs are required among the existing 229 wells throughout the storage fields. Wellhead leaks pose safety and environmental risks and must be removed from service while leak repairs are in progress. The costs for these wellhead leak repairs in $ millions are forecast to be $1.807, $1.807, and $1.807, for 2014, 2015, and 2016, respectively. Specific details regarding cost estimates for wellhead leak repairs identified as part of routine operations may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Four wellhead leak repairs requiring workover rig support are planned at an approximate cost of $450k each. Individual project costs typically vary due to the specific equipment required and configuration of the well being repaired.

c. Cost Drivers

The cost driver for this activity relates to the highly specialized nature of work performed on leaking high pressure wells and the skilled workforce and equipment employed. These repairs can be complex operations that require controlling underground well pressures, which can reach 3,600 psig.

4. C4-Well Inner-String Installations

a. Description

When the production casing in a well reaches the end of its useful life, an inner-string may be installed to extend the life of the well, depending on its mechanical condition. This methodology requires the installation of smaller-sized casing due to a loss of production casing integrity observed within the storage wells. Inner-string installations are used as a temporary or interim mitigation strategy in response to aging or damaged storage wells. The well must be removed from service and secured pending the installation process. The well will be unavailable for withdrawal or injection until the work is completed. The costs for inner-string installations in $ millions are projected to be $1.707, $1.707, and $1.707, for 2014, 2015, and 2016, respectively. Specific details regarding inner-string installations identified as part of routine operations are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

SoCalGas plans to complete two inner-string installations per year, at an approximate cost of $850k each.

c. Cost Drivers

The underlying cost drivers for this activity relate to the highly specialized nature of work performed on high pressure wells and the skilled workforce and equipment employed. These can be complex operations.

5. C5-Submersible Pump Replacements

a. Description

SoCalGas plans to replace existing electric submersible pumps in various storage wells. These pumped wells, required to control liquids and storage reservoir management, typically require replacement on a one to four year cycle. If pumps are not installed in a timely manner, there is the likely risk of reduced reservoir storage capacity. The forecast for 2014, 2015, and 2016 are $552K, $552K, and $552K, respectively. Specific details regarding these capital projects are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

SoCalGas typically replaces two electric submersible pumps per year, at an approximate cost of $275k each.

c. Cost Drivers

The cost drivers for these projects relate to equipment type and complexity, location, and availability of qualified contractors. Individual project costs can also vary due to the depth of the electric submersible pump being replaced. There are a limited number of qualified contractors who specialize in downhole pumps and controls. Thus, the prices for this very specialized work varies according to contractor workload and associated lead times. Parts and equipment costs are driven by the limited number of competing suppliers and the very specialized nature of these pumps.

6. C6-Well Stimulations/Re-Perforations

a. Description

SoCalGas plans to perform required "stimulation" or "re-perforation" of existing storage wells to improve poor deliverability rates. Storage wells that experience minor productivity damage can be restored via this method. These capital expenditures therefore support the company's goals of maintaining the integrity, efficiency, reliability and continuity of supply. The forecast for well stimulations and re-perforations work in 2014, 2015, and 2016 is $176K, $176K, and $176K, respectively. Specific details regarding these capital projects are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

The forecast is based on local knowledge of expected upgrades and capital project estimates prepared on experience.

c. Cost Drivers

The underlying cost drivers for these projects relate to the complexity of the operations and availability of qualified contractors. Parts and equipment costs are driven by the limited number of competing suppliers and the very specialized nature of the hardware they produce.

7. C7-Well Gravel Packs

a. Description

Gas flows will be restricted if a well has a failed gravel pack. Typically, a well will remain out of service until the well is repaired and re-gravel packed. SoCalGas plans to replace failed gravel packs from existing wells at historical rates. The costs in $ millions for well gravel pack replacements are forecasted to be $3.715, $3.715, and $3.715, for 2014, 2015, and 2016, respectively. Costs include the materials and services required to remove existing equipment,

sidetrack the well, install a new gravel pack, complete the well, and return the well to service. Specific details regarding gravel pack replacements are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Typically there are two gravel pack replacements performed per year at an approximate cost of $1.85 million each. Individual project costs may vary from well to well and field to field, depending on the actual depth and mechanical condition of the subject well.

c. Cost Drivers

The underlying cost drivers for this activity relate to the highly specialized nature of work performed on high pressure wells and the skilled workforce and equipment employed.

8. C8-Well Re-Drills

a. Description

It is not uncommon for a well to experience declining or poor deliverability with age. If a storage well has poor deliverability and the well is not re-drilled, the well will likely become a high operating cost, low productivity asset, with negative impacts to service reliability. SoCalGas expects to relocate bottom-hole locations for some wells due to poor or low deliverability. The costs in $ millions for well re-drills are projected to be $2.209, $2.008, and $0, for 2014, 2015, and 2016, respectively. Specific details regarding re-drill projects are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Re-drill costs are based upon historical projects of similar complexity. However, no storage well re-drills are planned for 2016.

c. Cost Drivers

The cost drivers for this activity relate to the highly specialized nature of work performed on high pressure wells and the skilled workforce and equipment employed.

9. C9-Well Replacements

a. Description

SoCalGas plans to replace mechanically constrained wells with curtailed deliverability, along with high operating cost aging injection/withdrawal wells and their associated production, with new wells that provide higher deliverability rates. These new wells are necessary replacements due to lost deliverability from failed gravel packs or poor deliverability rates from

other causes. It also includes the replacement of lost withdrawal capacity from the required abandonments of aging storage wells. The costs for replacement storage wells in $ millions are forecast to be $10.241, $10.442, and $18.273 for 2014, 2015, and 2016, respectively.

At the end of the 2013/2014 winter withdrawal season, during a period of high demand and low field inventory not seen in recent years, Aliso Canyon was not able to meet the deliverability levels expected from existing wells. Declining performance of older wellbores, along with the necessary plugging of problem wells, resulted in the field falling short of delivery expectations by more than 350 MMCFD. Having operated at higher inventories in recent years, this 20% downgrading of well performance was not readily apparent until early 2014.

With modern well design and completion techniques, opportunities exist to reduce the number of storage wells by drilling new replacement wells in a manner that may allow for better than a one-for-one replacement. Depending on the storage field and its geology, a newly drilled and completed replacement well is likely to provide the replacement deliverability of two or more existing older wells. This scenario would be repeated as each new replacement storage well is drilled, thus potentially reducing the overall storage well count and operating expenses.

These projects will locate and prepare drill sites, drill and complete new replacement storage injection/withdrawal wells to be strategically located throughout the Storage Fields. Included are all services and materials to complete each well. The anticipated numbers and locations of the replacement wells are as follows:

- 2014 - Two Aliso Canyon Storage Wells. This work is required to replace naturally declining deliverability from existing wells, and wells that were abandoned due to integrity concerns;

- 2015 - Two Goleta Storage Wells. This work is necessary to improve lost deliverability as well as decrease the footprint of the facility by bringing remotely located wells in a high consequence area closer to the main station and removing injection/withdrawal lines from environmentally-sensitive areas; and

- 2016 - Three Aliso Canyon Storage Wells. This work is needed to continue the replacement of lost deliverability due to the natural productivity declines from aging wells described above.

Specific details regarding storage well replacements are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Planned replacement wells located among the storage fields will vary in cost, but average approximately $5-6 million each. Costs are based on historical well drilling costs combined with recent vendor cost estimates.

c. Cost Drivers

The underlying cost drivers for these capital projects relate to the highly specialized nature of work performed on high pressure wells and the necessarily skilled workforce and equipment employed. These older storage wells typically require high cost casing repairs ($700K or more) per occurrence and/or repeated re-gravel packing of the wells due to highly erosive sand production. Costs of replacing the gravel packs of these aging wells are typically in the range of $2 million each. Phasing in these new higher-deliverability replacement wells and eliminating the high cost aging wells over time, may reduce the Company's long term operating costs by reducing the need for frequent, high cost, casing repairs and gravel pack capital projects.

10. C10-Well Plug and Abandonments

a. Description

SoCalGas plans to abandon aging, mechanically unsound wells that are beyond their useful lives. Required abandonments are becoming more frequent as various storage wells reach or exceed their useful lives. These subject wells become high risk, high operating cost assets due to poor or declining mechanical integrity, or complete lack of productivity due to age. A number of the abandonments are required for the removal of wells and their operations from environmentally sensitive areas or higher public risk areas and relocating the new replacement storage wells within storage field boundaries.

Currently there are 26 existing mechanically-unsound, unproductive, or aging storage wells located in environmentally-sensitive areas. SoCalGas will focus on the abandonment of aging storage wells located in environmentally-sensitive or high consequence areas. Projected costs include the material and services required to plug and abandon the wells in a manner that meets or exceeds California DOGGR requirements. The cost in $ millions for well plug and abandonments are forecasted to be $3.876, $6.195, and $4.688, for 2014, 2015, and 2016, respectively. Specific details regarding well abandonment projects are found in the capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Eight wells per year are planned for abandonment among the existing storage fields, at an approximate cost of $600K each. The individual well abandonment costs will vary depending on the condition of the well at the time of the abandonment, surface location of the well, in addition to the depth of the well to be abandoned.

c. Cost Drivers

The underlying cost drivers for these capital projects relate to the highly specialized nature of work performed on high pressure gas wells and the necessarily skilled workforce and equipment employed.

11. C11-Storage Blanket Projects

a. Description

SoCalGas plans to build and place in service multiple smaller projects with individual costs that do not warrant the preparation of individual workpapers. These forecasted capital expenditures support the goals of maintaining the safety of the public and employees, as well as operating efficiency, reliability and continuity of supply. The costs of individual projects in this category will vary from as low as ten thousand to as high as several hundreds of thousands of dollars. They include shallow zone work in the Aliso Canyon field, projects related to geology and storage engineering, and smaller technology upgrades. The forecast in $ million for 2014, 2015, and 2016 is $0.974, $1.125, and $0.824, respectively. Specific details regarding these projects are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

The forecasts of these smaller projects are based on local knowledge of required upgrades and capital maintenance projects prepared by experienced professionals who have worked in the Storage fields for years. This method is appropriate because these professionals are responsible for preparing a list of upgrades and projects, which is updated and prioritized regularly, based on equipment age, wear and tear, failure history, and technical obsolescence.

c. Cost Drivers

The underlying cost drivers for these kinds of projects relate to equipment type and complexity, operating location, availability of qualified contractors, and workload. There are a limited number of qualified contractors available for Storage field work. Thus, the prices for this very specialized work varies according to the contractor's workload and associated lead times.

Parts and equipment costs are driven by the limited number of competing suppliers and the very specialized nature of the hardware.

12. C12-Cushion Gas Purchases (Honor Rancho Expansion)

a. Description

SoCalGas plans to purchase cushion gas to support the final phase of the Honor Rancho expansion project. Cushion gas is the volume of gas intended to serve as the permanent inventory within a storage reservoir that is required to maintain adequate pressure for deliverability rates throughout the withdrawal season. The need for storage capacity expansion and its relationship to Gas System supply reliability was established by the CPUC in decision (D) 10-04-034. That discussion is incorporated herein by reference. The cost for cushion gas purchases in $ million is forecast to be $1.398, $1.398, and $0, for 2014, 2015, and 2016, respectively. Specific details regarding this estimate of cushion gas costs may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Costs are estimated for the purchase of 300 MMCF, at a price of $4.55 per decatherm.

c. Cost Drivers

The unit cost of the gas is driven by conditions in the natural gas market.

13. C13-Storage Integrity Management Program

a. Description

Reactive-type well repair work performed by Storage related to safety situations observed as part of routine operations has increased in recent years. In fact, a negative well integrity trend seems to have developed since 2008. The increasing number of well integrity conditions summarized in Table PEB-8 above are attributed primarily to the frequency of use, operating environment, age, and length of time the wells have been in service. In contrast to the reactive capital work discussed above, the SIMP is intended to proactively identify, diagnose, and mitigate potential safety and/or integrity problems associated with gas storage wells. It is important to distinguish that SIMP is incremental work above and beyond the levels traditionally performed. As such, it consists of accelerated mitigation work performed over a condensed period of time in response to the thorough well integrity inspections described above in section II D-2 of my testimony. Early identification and mitigation of well integrity issues will improve

safety and increase reliable gas deliveries. The capital costs in $ million for the SIMP are forecasted to be $2.008, $2.510, and $24.272 for 2014, 2015, and 2016, respectively.

Safety and/or integrity conditions that are presently unknown may exist within the high pressure (up to 3,600 psig) above ground pipe laterals and below ground facilities that comprise of 229 aging gas storage field wells that can exceed 13,000 feet in depth. Some SoCalGas wells are more than 80 years old while the average age of all Storage wells is 52 years. A proactive, methodical, and structured approach, using advanced inspection technologies, such as ultra-sonic and neutron type casing logs, along with risk management disciplines to address well integrity issues before they result in unsafe conditions for employees or the public, or become major incidents, is a prudent operating practice. In addition, some SoCalGas wells are located within close proximity to residential dwellings, as depicted in Figure PEB-2.

The primary threats to the SoCalGas well facilities that SIMP will address are internal and external corrosion, and erosion.[12] Immediate repairs may be necessary to minimize safety risks. Lesser risk integrity work will be prioritized to plan and efficiently execute mitigation actions.

SoCalGas proposes that these capital costs receive two-way balancing account treatment due to the highly unpredictable nature of estimating well mitigation costs. Factors contributing to the uncertainty include the unknown number of at-risk wells and their integrity status, the highly variable nature of well mitigation strategies, the uncertainty surrounding the volume and degree of repair work to be performed, the variable cost of consulting experts, when required, specialty equipment and skillful operators to be procured, and erratic field conditions typically encountered once repair work is initiated. All well work to be performed will be dependent on the site-specific conditions found at the time work is initiated. While average costs were utilized to prepare initial forecasts for SIMP, actual conditions and the scale of work to be performed can only be determined after the well is actually entered with inspection devices and/or repair tools. Given the fact that many of the wells have not been worked on in recent years, and the mature age of some wells, major problems and fixes of unknown costs are anticipated.

Past work on well Frew 3 at Aliso Canyon in 2013 is a good example of the wide variability in mitigation costs. Frew 3 was originally targeted for a tubing leak repair scheme,

[12] The gas withdrawn from storage formations typically contains water, sand, and reactive gas constituents such as carbon dioxide that can corrode or erode storage well components especially during periods of high demand.

estimated to cost approximately $600,000. Once the well was entered and repairs began, the wellbore was found to be compromised due to shifting geological formations requiring extensive work. The net result was a decision to abandon the well at a cost of $1.39 million, more than double the original repair estimate.

In addition, costs for the well rigs required for SIMP are dependent on activity throughout the oil and gas industry. The ability to secure equipment and associated prices are dependent on energy demand and rig availability worldwide. Financial outlays to secure rigs and oil/gas field services can vary greatly over time due to domestic and foreign developments related to energy.

b. Forecast Method

The forecast method used for the SIMP capital work is zero-based. This approach is most appropriate because it is an incremental program. The costs per units of work are based on historical averages, and internal labor support was established based on practical considerations and experience. Actual well repair methods will be based upon assessment findings, however, and optimized among the options described in the Capital Costs Section III C-Wells of my testimony. Unit costs based on historical prices of similar type work for the mitigation work would most likely consist of:

- Wellhead Valve Replacements ($85k)
- Well Tubing Replacements ($575k)
- Wellhead Leak Repairs ($450k)
- Well Inner-string Replacements ($850k)

Mitigation work could also consist of well abandonments, well redrills or well replacements typically cost approximately $0.6 million, $2.0 million, and $6 million, respectively.

The decision whether to re-drill an existing well or drill a replacement well as a risk mitigation strategy depends upon localized conditions encountered during the downhole inspections. If data indicate poor conditions of casing in the upper part of the wellbore, a re-drill solution is generally not an option. Other site-specific conditions that could justify a replacement well over a re-drill are wells with a small casing, existing condition of the well/casing cement bond, proximity of integrity issues relative to the surface, and the geographic location of the well within the reservoir. Re-drill versus replacement decisions will be made by

experienced storage reservoir engineering personnel using knowledge, professional judgment and site specific information.

Labor totaling 6.5 FTEs to support the capital program consists of two Contract Administrators for Aliso Canyon, and one each for the remaining three fields, one Well Mitigation Project Manager, and 0.5 FTE clerical support. Company labor estimates are presented in Table PEB-13 below.

Table PEB-13
Southern California Gas Company
SIMP Capital Cost Detail

Description	Annual Number	Unit Cost	Estimated Total
		(Thousands of $2013)	
Wells Requiring Capital Mitigation Work	28	$429	$12,014
Lateral Piping Replacements	5	$75	$375
Company Labor FTEs	6.5	N/A	$945
Well Inspection Costs Reassigned to Capital	28	N/A	$10,936
Total Capital	-	-	$24,272

c. Cost Drivers

The most significant cost driver for this uniquely specialized work performed on high pressure wells is the availability of workover rigs, material costs, the skilled field and technical workforce required to produce and analyze data, and the equipment to be employed. Other cost drivers include the unique solutions required to address the conditions discovered during exploratory examinations of the wells, equipment, well design, and permitting requirements.

D. Storage Pipelines

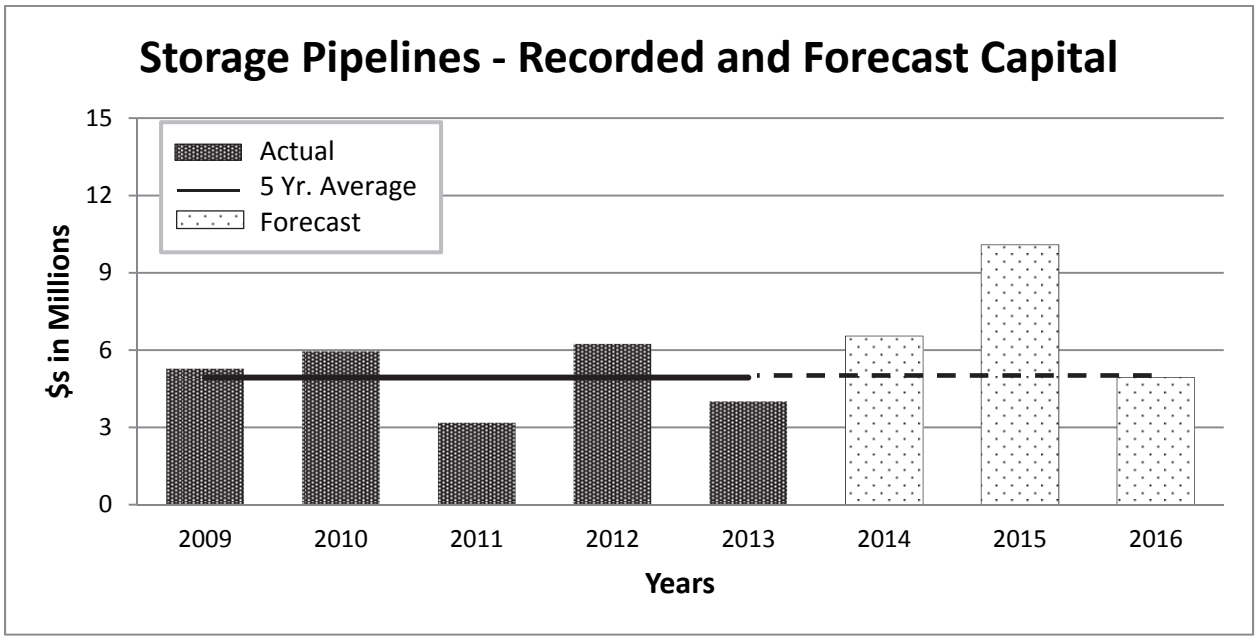
This Budget Category includes costs associated with upgrading or replacing failed field piping and related components. The cost forecast for this work is summarized in Table PEB-14 below.

Table PEB-14
Southern California Gas Company
Capital Expenditures for Storage Pipelines

STORAGE PIPELINES	Thousands of 2013 Dollars		
	Estimated 2014	Estimated 2015	Estimated 2016
D1- Valve Replacements	$889	$889	$688
D2- Aliso Pipe Bridge Replacement	$505	$3,526	$0
D3- Aliso Injection System Debottlenecking	$0	$505	$505
D4- Aliso Canyon Piping Improvements	$1,313	$152	$505
D5- Playa del Rey Withdrawal Debottlenecking	$505	$2,526	$0
D6- Pipeline Blanket Projects	$3,334	$2,485	$3,233
Total	**$6,546**	**$10,083**	**$4,931**

Figure PEB-9 below depicts the Storage Pipeline costs from Table PEB-14.

Figure PEB-9
Southern California Gas Company
Historical and Forecasted Storage Pipelines Capital



The Storage Pipelines category in this testimony is further described using the following sub-sections:

- D1-Valve Replacements
- D2-Aliso Pipe Bridge Replacement
- D3-Aliso Injection System Debottlenecking

- D4-Aliso Canyon Withdrawal System Debottlenecking
- D5-Playa del Rey Withdrawal Debottlenecking
- D6-Blanket Projects

1. D1-Valve Replacements

a. Description

Valves within the storage fields can leak or allow gas to pass as they wear and age. SoCalGas plans to replace various valves of differing sizes and pressure ratings throughout the year, depending on line shut-in capability and valve conditions. The costs for valve replacements are estimated to be $889k, $889k, and $688k for 2014, 2015, and 2016, respectively. Specific details regarding this valve work may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Historical average costs are approximately $20K per valve. The estimated number of replacements, approximately 5% of the larger field valves every year, is based on recent operational experience.

c. Cost Drivers

The underlying cost drivers for this capital category relate to the purchase price of the valves and their installation costs. This includes specialized work performed on high pressure gas lines and the skilled workforce and equipment employed for replacements.

2. D2-Aliso Pipe Bridge Replacement

a. Description

SoCalGas plans to relocate an existing pipe rack in Aliso Canyon out of a ravine area with an active landslide and soil erosion condition that is threatening several existing pipe supports. Failure of pipe and supports in this ravine could result in the potential loss of gas injection/withdrawal capabilities of 21 wells in Aliso Canyon's east field. The combined withdrawal capacity of these wells is approximately 600 MMCFD. A Rupture of these pipes could result in the release of crude oil and brine water into the stream at the bottom of the ravine. The costs in $ million for the Aliso Pipe Bridge Replacement are projected to be $0.505, $3.526, and $0 for 2014, 2015, and 2016, respectively. Specific details regarding this project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

The project costs were derived by estimates from structural steel fabricators and installation contractors.

c. Cost Drivers

The underlying cost driver for this capital project relates to the soil types, customized design, permits, steel fabrication, and the highly specialized nature of work performed on high pressure gas piping, and the skilled workforce and equipment employed.

3. D3-Aliso Injection System Debottlenecking

a. Description

Through the evolution of the Aliso Canyon storage field, piping restrictions have developed. SoCalGas plans to improve the injection capacities at Aliso Canyon through the installation of larger diameter pipe and associated pipe supports. With new projects such as Aliso Canyon Turbine Replacement, and planned well replacements, the system piping will be studied to eliminate sections that restrict the flow of gas to the storage wells. Pipe will be sized to meet the specific injection criteria. This project will allow for a more efficient gas injection process. If bottlenecks are not removed, adequate pipe capacity at the intended rate of injection at maximum capacity will not be achieved. The costs for the injection system debottlenecking are forecast to be $0, $505k, and $505k for 2014, 2015, and 2016, respectively. Specific details regarding this project are found in my capital workpapers. See 06-CWP.

b. Forecast Method

Estimated costs are based on recent projects of similar pipe size, scope and complexity.

c. Cost Drivers

The underlying cost drivers for this capital project relate to material costs and the highly specialized nature of work performed on high pressure gas injection piping and the skilled workforce and equipment employed.

4. D4-Aliso Canyon Piping Improvements

a. Description

SoCalGas plans to perform necessary work to minimize piping restrictions in the Aliso Canyon withdrawal system. In addition, work is also planned for a remote well-kill safety system, installation of field utility gas system (Master Lease Gas), and replacement of high pressure liquid handling pipelines. The improvement of these systems will allow for remote

killing of the wells, a cleaner source of motive gas in the field for equipment, and the continued reliability of liquid-carrying piping. The liquid handling pipelines are critical to liquid removal operations from the high pressure gas system that transports, cleans, dehydrates, and meters gas from the facility. If the liquid handling pipelines were to fail, gas deliveries may be significantly impacted or sent through metering without complying with standards for water content in pipeline-quality natural gas. Safety equipment in the field also requires clean motive gas for proper operations. Each of these projects will require new piping, pipe supports and possibly pipe trenches. The costs for these piping improvements are forecast to be $1,313k, $152k, and $505k for 2014, 2015, and 2016, respectively. Specific details regarding these projects may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Estimated costs are based on recent projects of similar equipment size, scope and complexity.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed on high pressure pipelines and the skilled workforce and equipment employed.

5. D5-Playa del Rey Withdrawal Debottlenecking

a. Description

SoCalGas plans to perform necessary work to alleviate system bottlenecking in the Playa del Rey withdrawal system. Upgrade of the lower field equipment and piping would help maintain deliverability capacity while achieving the desired standards for water content in pipeline-quality natural gas. The work will include replacement of withdrawal equipment and installation of newly resized piping. The costs in $ million are estimated to be $0.505, $2.526, and $0, for 2014, 2015, and 2016, respectively. Specific details regarding this project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

This cost estimate is based on previously-completed work, vendor quotes for similar equipment, and current contractor rates.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed and the skilled workforce and equipment employed.

6. D6-Pipeline Blanket Projects

a. Description

SoCalGas plans to perform necessary work to alleviate various pipeline issues. This can include various projects including pipe replacements, expansions, upsizing, supports, corrosion protection, and other elements related to piping systems. The upgrade of station piping will help maintain injection and deliverability capacity. The costs in $ million are estimated to be $3.334, $2.485, and $3.233, for 2014, 2015, and 2016, respectively. Specific details regarding these projects may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

This cost estimate is based on the assumption that future costs and projects will be similar in scope and pricing to historical levels.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed and the skilled workforce and equipment employed.

E. Storage Purification Systems

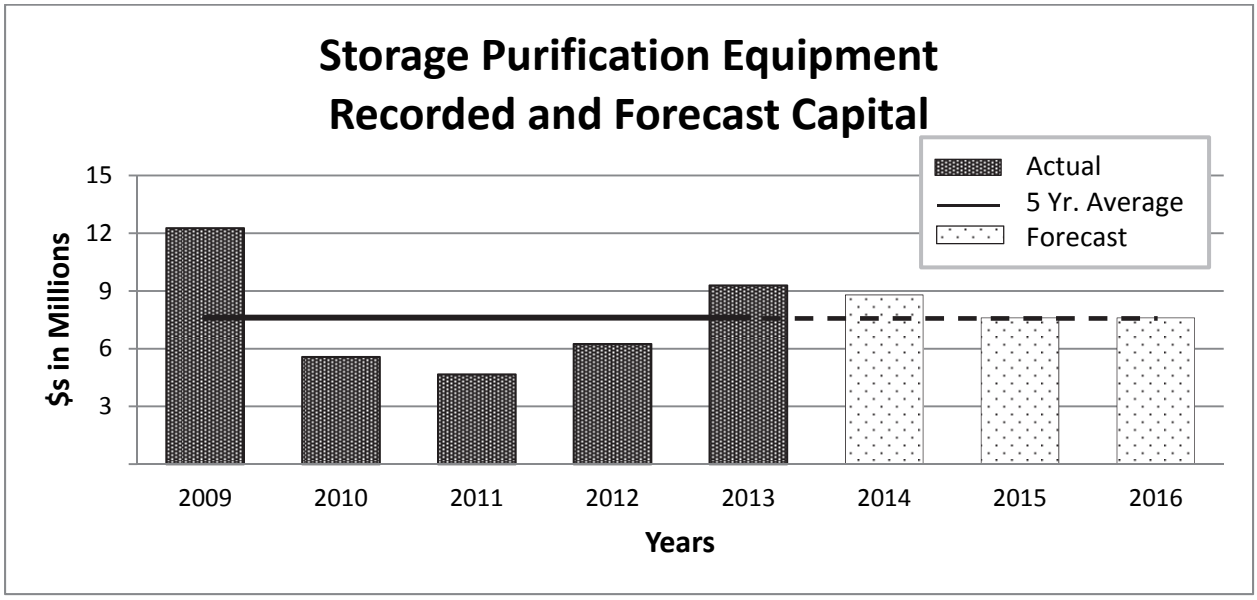
This budget category forecasts costs associated with equipment used primarily for the removal of impurities from, or the conditioning of, natural gas withdrawn from storage. Examples of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power supply, controls, and instrumentation. Table PEB-15 below summarizes the forecast of capital expenditures for Storage Purification Systems.

Table PEB-15
Southern California Gas Company
Capital Expenditures Purification Systems

STORAGE PURIFICATION SYSTEMS	Thousands of 2013 Dollars		
	Estimated 2014	Estimated 2015	Estimated 2016
E1- Aliso Canyon Dehydration Upgrades	$1,018	$1,018	$1,018
E2- Honor Rancho Dehydration Upgrades	$3,094	$992	$0
E3- Goleta Dehydration Upgrades	$3,055	$1,018	$0
E4- Purification Blanket Projects	$1,629	$4,577	$6,587
Total	**$8,796**	**$7,605**	**$7,605**

Figure PEB-10 below illustrates the Purification Systems forecast from Table PEB-15.

Figure PEB-10
Southern California Gas Company
Historical and Forecasted Purification Systems Capital



The Storage Purification Systems category in this testimony is further described using the following sub-sections:

- E1-Aliso Canyon Dehydration Upgrades
- E2-Honor Rancho Dehydration Upgrades
- E3-Goleta Dehydration Upgrades
- E4-Purification Blanket Projects

1. E1-Aliso Canyon Dehydration Upgrades

a. Description

This project will include the installation of new gas and glycol filters for improved gas conditioning. Instrumentation upgrades will also improve the ability to remotely monitor the plant during operation. In addition, the site Motor Control Center will be replaced to better support existing and new equipment. The Dehydration 2 plant at Aliso Canyon has withdrawal capacity of approximately 750 MMCFD. SoCalGas has plans to upgrade the Dehydration 2 plant to increase its withdrawal capacity. Without this project, the station may not be able to adequately comply with standards for water content in pipeline-quality natural gas and achieve

future planned increases in withdrawal capacity. The estimated forecasts in $ million for this project are $1.018, $1.018, and $1.018, for 2014, 2015, and 2016 respectively. Specific details regarding this project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Costs are based on quotes provided by vessel fabricators, equipment manufacturers, contractor estimates, and similar work completed on previous projects.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed, the necessarily skilled workforce, equipment employed, and the cost of materials.

2. E2-Honor Rancho Dehydration Upgrades

a. Description

SoCalGas plans to separate dehydration trains and install filters to allow for more flexibility of operations, less downtime during routine maintenance, improved gas conditioning, and a reduction in glycol degradation. The Programmable Logic Controller system will be upgraded to meet the new operating requirements and instrumentation needs. Without this project, the station may require extended and more frequent shutdowns as part of routine maintenance activities. In addition, this project will also allow the station to better achieve water content standards in pipeline-quality natural gas. The costs for improvements in $ million are $3.094, $0.992, and $0, for 2014, 2015, and 2016, respectively. Specific details regarding this capital project are found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Costs are based on quotes provided by vessel fabricators, equipment manufacturers, contractor estimates, and similar work completed on previous projects.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed, the necessarily skilled workforce and equipment employed and the cost of materials.

3. E3-Goleta Dehydration Upgrades

a. Description

SoCalGas plans to install new gas and glycol filters, heat exchangers, glycol regeneration equipment upgrades and instrumentation for remote monitoring in order to improve dehydration efficiency. This project will also allow the station to better achieve water content standards in pipeline-quality natural gas. Costs for the Goleta dehydration project in $ million are projected to be $3.055, $1.018, and $0 for 2014, 2015, and 2016, respectively. Specific details regarding this capital project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Costs are based on quotes provided by vessel fabricators, equipment manufacturers, contractor estimates, and similar work completed on previous projects.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed, the necessarily skilled workforce and equipment employed, and the cost of materials.

4. E4-Purification Blanket Projects

a. Description

SoCalGas plans to perform necessary work to alleviate gas processing and purification issues. This can include work on various equipment including dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power supply, controls, and instrumentation. Upgrade of purification equipment will help maintain deliverability capacity and allow the station to better achieve water content standards in pipeline-quality natural gas. The costs in $ million are estimated to be $1.629, $4.577, and $6.587, for 2014, 2015, and 2016, respectively. Specific details regarding this project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

This cost estimate is based on historical and expected levels of work.

c. Cost Driver(s)

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed and the skilled workforce and equipment employed.

F. Storage Auxiliary Systems

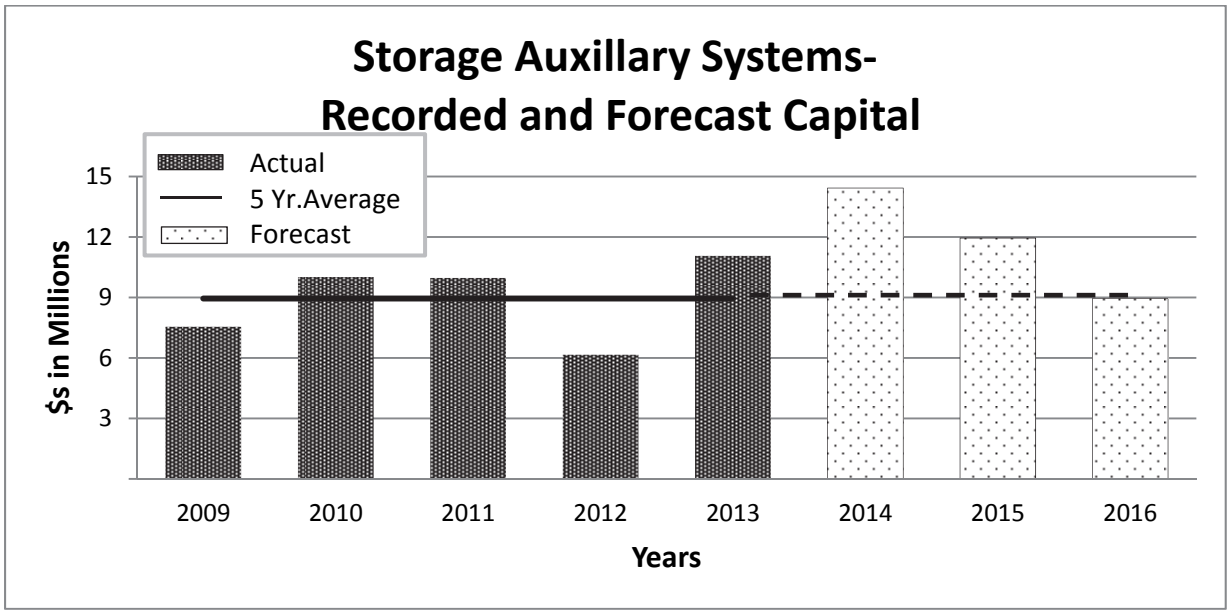
This budget code includes work on various types of field equipment not included in other budget codes such as instrumentation, measurement, controls, electrical, drainage, infrastructure, safety, security, and communications systems. The costs associated with this work are summarized in Table PEB-16 below.

Table PEB-16
Southern California Gas Company
Capital Expenditures for Storage Auxiliary Systems

STORAGE AUXILIARY SYSTEMS	Thousands of 2013 Dollars		
	Estimated 2014	Estimated 2015	Estimated 2016
F1-Aliso Central Control Room Modernization	$2,021	$1,010	$0
F2-Aliso Main Plant Power Line Upgrade	$1,010	$0	$0
F3-Aliso Sesnon Gathering Plant Project	$1,111	$303	$1,010
F4-Auxiliary Systems Blanket Projects	$10,256	$10,609	$7,938
Total	**$14,398**	**$11,922**	**$8,948**

Figure PEB-11 below depicts the Auxiliary Systems cost forecast from Table PEB-16.

Figure PEB-11
Southern California Gas Company
Historical and Forecasted Auxiliary Systems Capital



The Auxiliary Systems category in this testimony is further described under the following sub-sections:

- F1-Aliso Canyon Central Control Room Modernization
- F2-Aliso Canyon Main Plant Power Line Upgrade
- F3-Aliso Canyon Sesnon Gathering Plant Project
- F4-Auxiliary Equipment Blanket Projects

1. F1-Aliso Central Control Room Modernization

a. Description

SoCalGas plans to update, modernize and reconfigure the control room at the Aliso Canyon storage facility. This project includes modernization of control room displays, communication equipment, and building renovation. Without this upgrade of the control room, the station operators would be unable to efficiently monitor and operate the new equipment. The costs for the Aliso Central Control Room Modernization project in $ million are forecast to be $2.021, $1.010, and $0, for 2014, 2015, and 2016 respectively. Specific details regarding this project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Estimated costs are based on recent projects of similar scope and complexity in addition to recently-received vendor quotes.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed, the skilled workforce and equipment employed, and the cost of materials.

2. F2-Aliso Main Plant Power Line Upgrade

a. Description

SoCalGas plans to improve the overhead power system with new poles and wire to withstand 120 mile per hour wind load requirements. The new system will continue to allow the main plant, dehydration units and gathering plant to be energized by Southern California Edison, onsite generators, or alternate powers sources. Portions of the system will be installed underground. The project will eliminate wood poles, reduce fire danger and strengthen the electrical lines for high wind conditions. This project will provide Aliso Canyon with increased electrical reliability by upgrading the electrical system infrastructure at the main plant,

dehydrators, and gathering plants to remain electrified with utility power during "Red Flag" events. South Coast Air Quality Management District variance requests are required for operation of the onsite generators used during red flag events. This project will also decrease the need for air quality permit variances. The costs forecast in $ million are $1.010, $0.500, and $0, for 2014, 2015, and 2016, respectively. Specific details regarding this capital project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Costs are based on previously-completed work of similar content and scope. Similar work that increased the wind load capability of the local electrical system was completed at the Porter water injection site in 2012.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the design, the specialized nature of work performed, the availability of qualified workers and equipment purchases.

3. F3-Aliso Sesnon Gathering Plant Project

a. Description

Safety items of concern identified during a process hazard analysis of the pressure relief system at the Aliso Sesnon Gathering Plant will be addressed with a redesign. The current pressure relief system has several critical low points that could interfere with the gathering plant pressure relieving equipment during a full system blow down. The liquid buildup could potentially overwhelm the liquid removing equipment, causing gas withdrawal rates to be reduced. The relief vessel will be relocated, system piping will be modified to eliminate low points, and relief valves will be replaced to better satisfy process conditions. The costs for this project in $ million are forecast to be $1.111, $0.303, and $1.010, for 2014, 2015, and 2016, respectively. Specific details regarding this work may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

Estimated costs are based on vendor quotes and previously completed work.

c. Cost Drivers

The underlying cost drivers for these capital projects relate to the highly-specialized nature of work performed, the availability of necessarily-skilled workforce and equipment employed and the cost of materials.

4. F4-Auxiliary Systems Blanket Projects

a. Description

SoCalGas plans to perform necessary work to alleviate instrumentation, Supervisory, Control and Data Acquisition, measurement, controls, electrical, cyber security, and other auxiliary systems support issues. This can include work on various equipment including, coolers, scrubbers, boilers, pumps, valves, piping, and power supplies. The upgrade of auxiliary systems will help maintain safety, security, deliverability, and reliability in the delivery of pipeline-quality natural gas. The costs of this project in $ million are estimated to be $10.256, $10.609, and $7.938, for 2014, 2015, and 2016, respectively. Specific details regarding this project may be found in my capital workpapers, Exhibit PEB-06-CWP.

b. Forecast Method

This cost estimate is based on historical and expected levels of work.

c. Cost Drivers

The underlying cost drivers for this capital project relate to the highly specialized nature of work performed and the skilled workforce and equipment employed.

IV. CONCLUSION

In this testimony, I describe activities and projects necessary for SoCalGas to achieve its goals of maintaining the safety and reliability of critical gas underground storage infrastructure. The expenditures discussed in this testimony are required to maintain public and employee safety while cost-effectively meeting customer needs, in compliance with mandated regulatory requirements. My O&M and capital forecasts represent a reasonable level of funding for the critical activities and capital projects planned during this forecast period. The forecasts of the planned O&M and capital expenditures represented in this testimony are appropriate and prudently derived, and should be adopted by the Commission. Implementation of the proposed SIMP is justified and prudent and the request for balancing account treatment for SIMP costs is reasonable and should be adopted.

This concludes my prepared direct testimony.

V. WITNESS QUALIFICATIONS

My name is Phillip E. Baker. I am employed by Southern California Gas Company. My business address is 9400 Oakdale Ave., Chatsworth, California 91313-6511.

I am the Director of Storage. In this capacity, I am responsible for maintaining the integrity of the storage system to ensure a safe, reliable supply of natural gas for customers throughout the SoCalGas and SDG&E service territory.

I have a Bachelor of Science degree in Civil Engineering from California State University at Los Angeles. I have worked for SoCalGas for thirty-five years, with a broad background in engineering and gas operations. Throughout my career I have held various staff and operations positions in Gas Distribution, Engineering, Gas Transmission, Fleet, Facilities and Logistics, and Customer Services. In recent years, I have held the positions of Director-Customer Services, Director-Distribution Services, Director-Commercial and Industrial Services. I was named to my present position, Director-Storage, in 2013.

I have previously testified before the Commission.

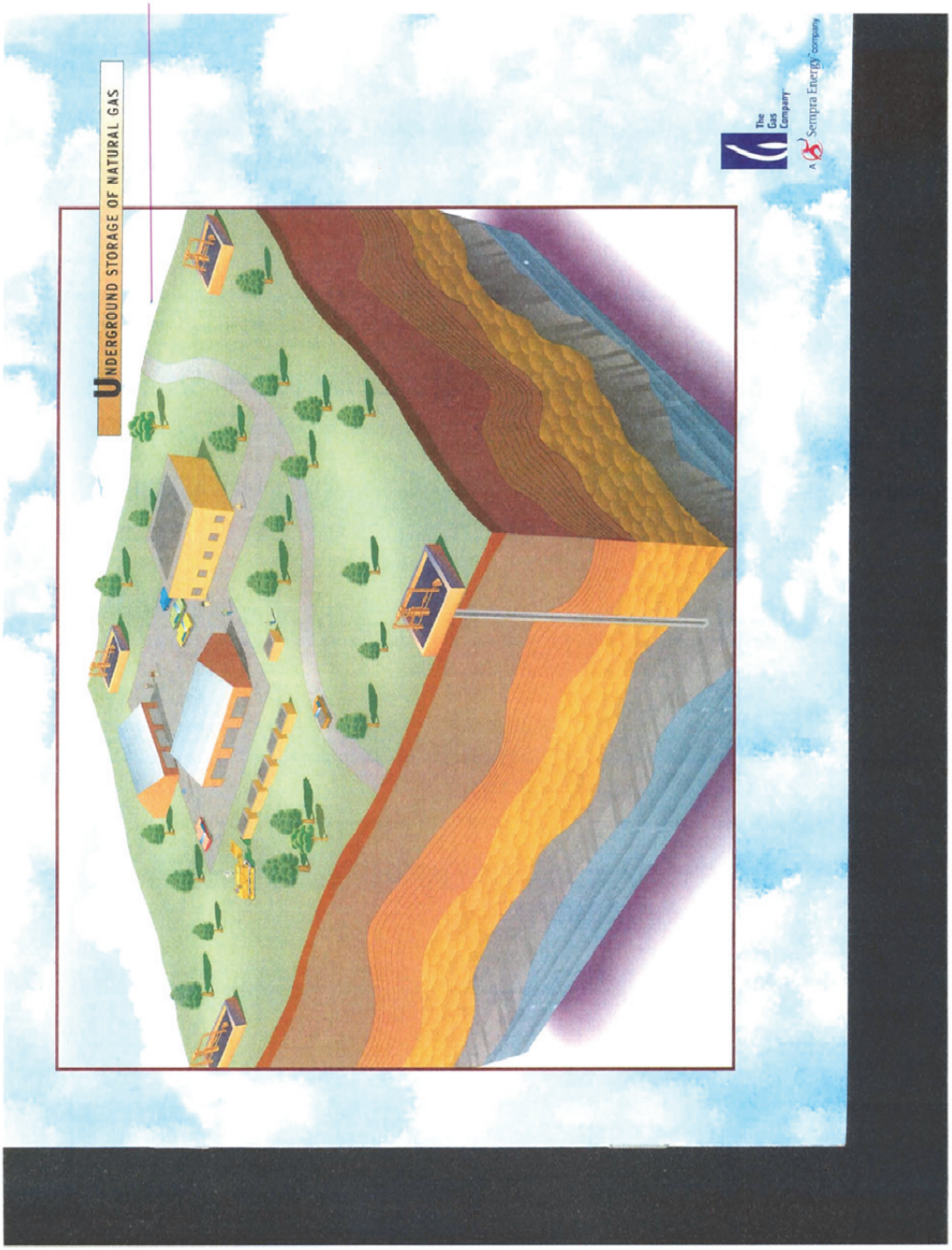
Appendix A

Glossary of Acronyms

BCF	Billion Cubic Feet
BCFD	Billion Cubic Feet per Day
CPUC	California Public Utilities Commission
DIMP	Distribution Integrity Management Program
DOGGR	California Department of Oil, Gas and Geothermal Resources
DOT	United States Department of Transportation
FTE	Full Time Equivalents
MMCF	Million Cubic Feet
MMCFD	Million Cubic Feet per Day
NERBA	New Environmental Regulatory Balancing Account
O&M	Operations and Maintenance
PSIG	Pounds per Square Inch Gauge
SoCalGas	Southern California Gas Company
SIMP	Storage Integrity Management Program
TCAP	Triennial Cost Allocation Proceeding
TIMP	Transmission Integrity Management Program

Appendix B

Underground Storage of Natural Gas


UNDERGROUND STORAGE OF NATURAL GAS
The Gas Company
A Sempra Energy company

STORING NATURAL GAS THE SAME WAY NATURE ALWAYS HAS...DEEP UNDERGROUND

Underground storage is based on the simple premise that if an underground rock formation held oil and gas securely for millions of years, it could continue to do so under controlled conditions.

Most of the natural gas used in Southern California travels from supply sources as far away as Texas and Canada. So, in order to maintain a balance between supply and demand, storage is a necessity. Without it, we might not always be able to meet our customers' needs.

Customer needs change by the season, by the day, even by the hour. On a cold winter day, for example, residential customers can use seven times the amount of gas used on an average summer day.

Five decades ago, balancing customer demand meant relying on gas holding structures, which stood several stories high and resembled oil storage tanks.

In 1941 we introduced a new system to the Southwest: underground storage of natural gas. This system is based on the simple premise that if an underground rock formation held oil and gas securely for millions of years, it could continue to do so under controlled conditions.

Extensive research and our experience have proven that this concept is sound. Depleted oil and gas fields offer ideal storage conditions because they are comprised of natural underground traps. Care is taken that the original formation pressure of the field is not exceeded. These subterranean rock formations can be repeatedly refilled and drawn from to meet the fluctuating needs of our customers.

When out-of-state pipelines can't deliver enough gas to meet heavy demand, which might occur on a cold winter day, we withdraw gas stored underground to supplement pipeline supplies. When customer needs for gas drop below the available pipeline supply, which can happen during the summer, we inject the surplus gas into the underground reservoirs. We also sell storage capacity to other large companies so they will have natural gas (which they purchase on the open market) available to them when they need it.

WHERE IS THE GAS STORED?

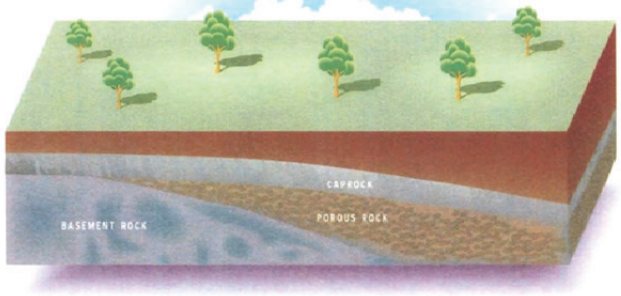
Surplus natural gas is forced down through wells drilled into porous rock formations thousands of feet below the earth's surface, where oil and gas originated. The formations appear solid but are actually sandstone made up of sand, with spaces between the grains.

The rock formations are called "geologic traps" because they are shaped by nature, and trap and hold gas, oil and water within a specific area. Like a sandwich, the basic trap contains porous reservoir rock between layers of nonporous rock. The top layer is commonly called "caprock," while the bottommost layer is often called "basement rock."

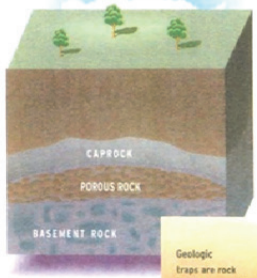
There are several different kinds of geologic traps. One is a **pinch-out trap** (left, below), in which the caprock meets the basement rock at one end, effectively sealing the porous storage area. The most common geologic trap is the anticlinal trap (right, below), which resembles a buried hill. This is because the caprock arches over the top of the porous rock "reservoir" to stop gas from traveling upward. Another type of trap is formed by shifts in the ancient earth strata that moved one section of rock against another, so that it abuts the caprock, creating a fault-bounded trap.

We can depend upon the force of gravity to separate the gas, oil and water that may already be in any trap. As the lightest component, natural gas will always rise to the top.

Pinch-out Trap

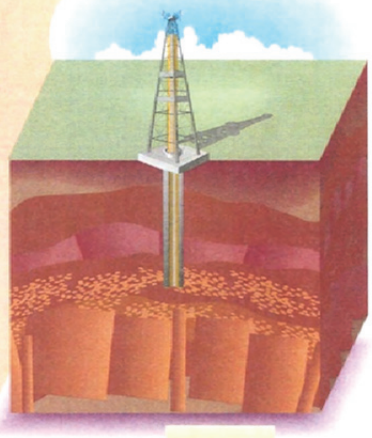


Anticlinal Trap



Geologic traps are rock formations which trap and hold gas, oil and water.

WHAT DETERMINES A GOOD STORAGE FIELD



Core samples are taken by drilling with a hollow core deep into the earth.

Core Samples

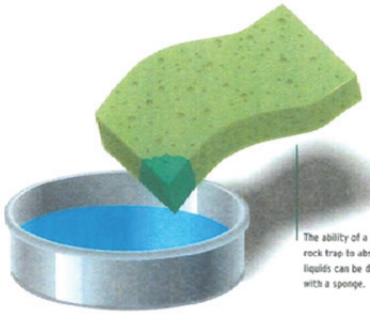
Before using any former oil or gas field for our storage, extensive geologic data of each of the field's rock layers are carefully examined. This usually is accomplished by studying "core samples," which are taken by drilling with a hollow core with a diamond cutting edge deep down through the earth's sedimentary layers.

Numerous core samples and other geologic surveys help us profile a specific field. Measuring anywhere from 10 to 60 feet (3 to 20 meters) long, the core samples tell us the location, depth and condition of the caprock, the storage reservoir and the basement rock. They also determine the present concentrations of any gas, oil or water deposits.

Porosity

The first characteristic we look for when examining the core samples is porosity. Porosity refers to the volume percentage of rock pore space available for gas or liquid retention between the rock or sand grains. It is essential that the reservoir rock have high porosity, because that indicates a high storage capacity.

The ability of porous rock to absorb gas and liquids can be demonstrated with a sponge. Take the sponge and barely touch one corner to the surface of a liquid. Watch it soak up the liquid until saturated, without altering the shape or size of the sponge. The fluid simply fills the small pores of the sponge. Underground storage is based on the same principle.



The ability of a porous rock trap to absorb gas and liquids can be demonstrated with a sponge.

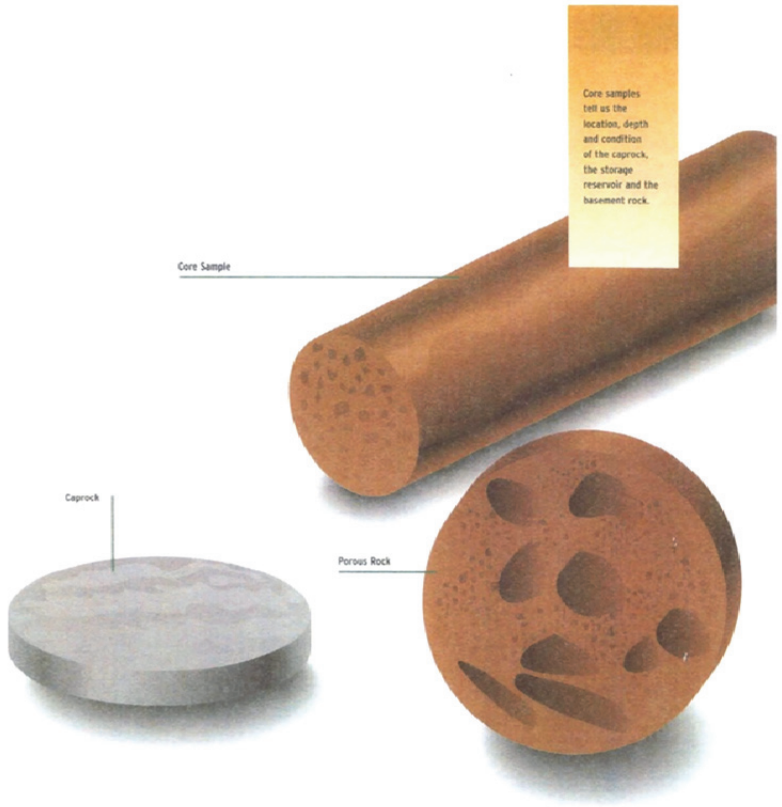
Permeability

Permeability, closely related to porosity, is another characteristic we look for when evaluating core samples. Permeability is important for efficient gas storage because it measures how well the pore spaces are interconnected.

It is essential that the reservoir rock be highly permeable because the gas must be able to move freely through the storage zone during injection and withdrawal. If the rock isn't very permeable, meaning most of the pore spaces are isolated, then the gas injection and withdrawal rates will be low.

In caprock, we look for just the opposite. A rock such as shale is an ideal caprock since its impermeability prevents natural gas from travelling upwards and being lost.

Below the caprock, we need a porous, permeable layer of rock that will permit gas to flow in and out of the reservoir. The underlying water-saturated rock and dense basement rock trap the lighter gas in place above.



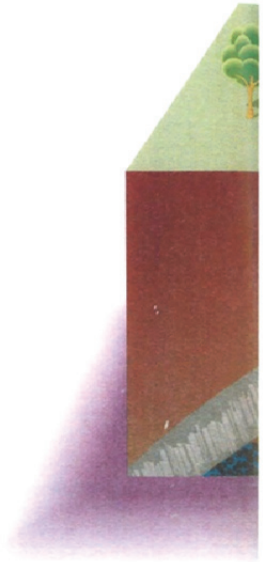
A TYPICAL UNDERGROUND GAS STORAGE FIELD

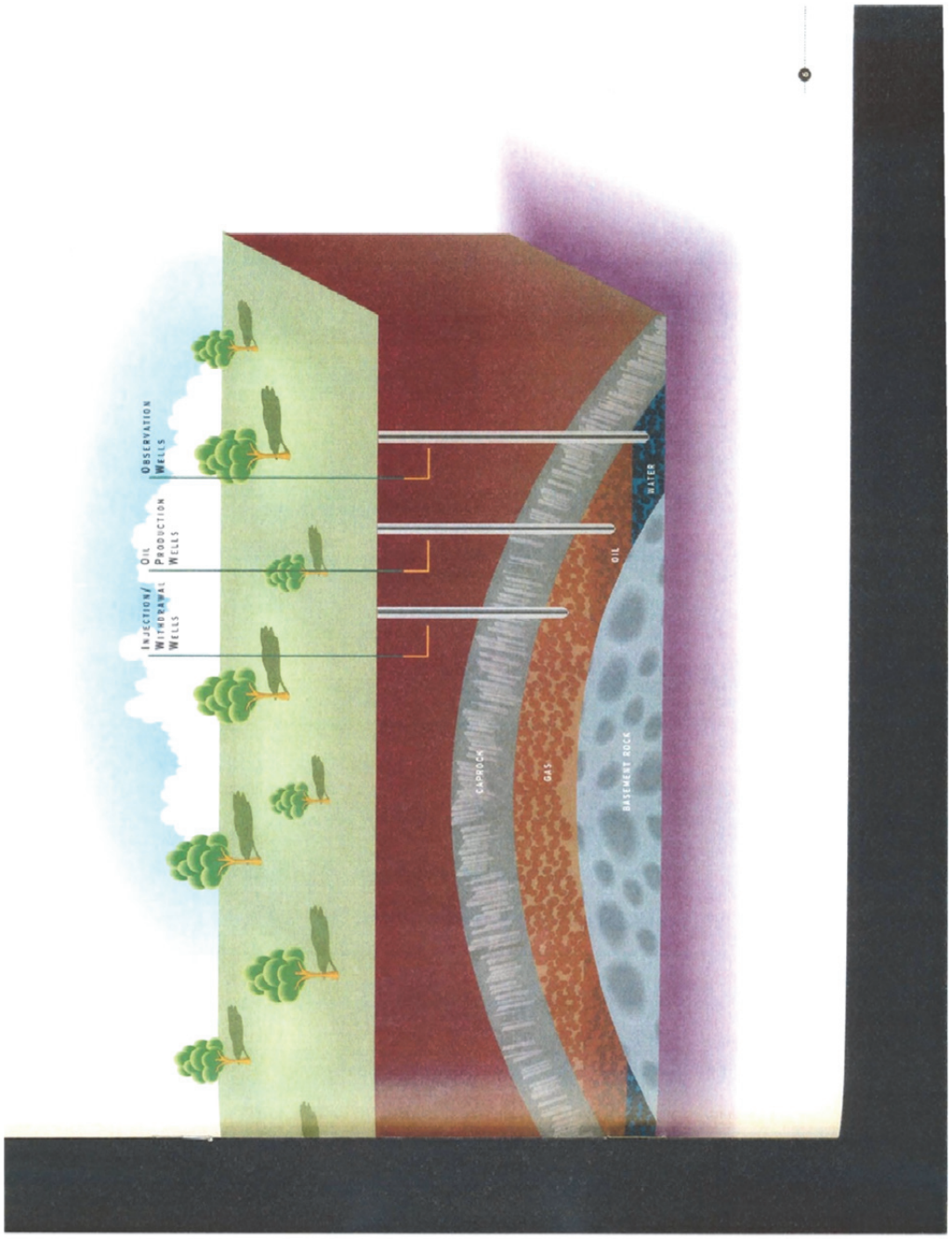
As shown at right, we operate three basic types of wells in our gas storage fields. Some of these wells still produce oil and water when natural gas is withdrawn.

1 Injection/Withdrawal Wells
Functioning in the upper level of the reservoir and at lower depths, these wells are used for withdrawing natural gas from storage. Many of these wells are also used to inject natural gas into the storage zone.

2 Oil Production Wells
To maintain the size and shape of the reservoir, oil and water must be removed from lower reservoir zones whenever gas is injected or withdrawn. This balancing operation prevents the higher-pressure liquids from moving up too far into the gas storage zone. These wells are either free-flowing oil wells or pumping oil wells. They are very similar except that pumping oil wells require pumping assistance because of insufficient reservoir pressure. Since the La Goleta storage field does not produce oil, these wells are not needed there.

3 Observation Wells
Observation wells are used for monitoring reservoir pressures and the integrity of the caprock.




Injection/
Withdrawal
Wells
Oil
Production
Wells
Observation
Wells
Caprock
Gas
Oil
Water
Basement Rock

Storage operations are activated on orders from our gas control center to specific storage fields. Customarily, storage is required for seasonal load balancing: injecting summer supplies of gas underground to be held in reserve for winter withdrawal.

Injection

Storage operations are activated on orders from our gas control center to specific storage fields. Customarily, storage is required for "seasonal load balancing" injecting summer supplies of gas underground to be held in reserve for winter withdrawal.

Scrubbing

As natural gas comes from the pipeline, it is run through intake scrubbers to remove any liquids that may have accumulated in the pipeline and might damage the compressors. Only gas that meets set specifications is brought into our pipeline system and injected into our fields.

Compression

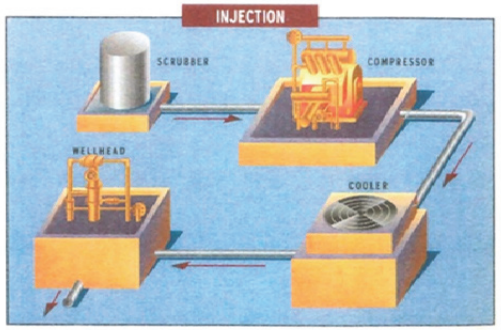
Gas supplies in transmission pipelines flow under pressures often ranging from 250 to 1,030 pounds per square inch (17 to 71 bars). The pressure in the underground storage reservoir, however, can be up to three or four times higher. To force the gas a mile or more down into the porous rock, it must be compressed to 1,500 psi (103 bars) or higher. This function is handled in two stages. Initially, high horsepower engines boost the pressure up to 800 to 1,500 psi (55 to 103 bars), significantly raising the temperature of the gas since compression generates heat. To increase compression efficiency, the gas is next sent through cooling equipment before the second compression stage boosts it to 1,500 to 3,900 psi (103 to 270 bars), completing the process. Before injection, the compressed gas will again be cooled to protect pipelines and other equipment in the storage field.

Cooling

Most of our storage facilities use the unique cooling system known as a "fin-fans." Appropriately named, each cooler contains a set of giant fan blades, whose rapid rotation pulls cool air across a system of tubes containing the gas. The tubes are wrapped with thin aluminum "fins" that assist in the cooling.

The Wellhead

Generally referred to as a "Christmas tree," this collection of piping and valves controls all gas movement in and out of the storage wells. The Christmas tree controls are easily accessible to the crews which operate them during injection and withdrawal of gas.



STORAGE FACILITY

Withdrawal

Just as in storage injection, the signal to commence withdrawal of gas from storage is relayed to the field from our main gas control center. Withdrawal is usually ordered to meet heavy customer demand (1) throughout the cold, rainy winter season; (2) on air pollution episode days; or (3) during peak-load conditions when gas from storage augments the volumes constantly flowing in from out-of-state suppliers.

The Wellhead

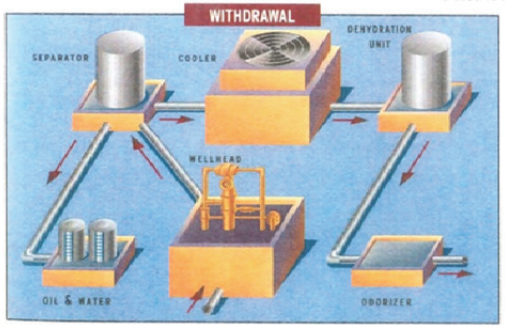
To start withdrawal, valves at the well site must be opened. Both injection/withdrawal wells and oil wells can be used to withdraw natural gas supplies, although the percentage of gas produced by the oil wells is limited.

Separators

When gas is withdrawn from the field, it generally flows under its own pressure directly into special vessels which separate most of the oil and water from the gas coming out of storage. Since gas is lighter than the accompanying fluids, it rises in the vessels, where it is collected for cooling. The oil and water left behind are separated, with the oil stored in tanks to be sold and the water stored for disposal or reinjected into the ground.

Cooling and Dehydration

When gas is removed from underground storage, it brings along petroleum liquids, water vapor and the hot temperatures from the earth a mile or two below. The gas is cooled by running it through a cooling system, and any free liquids are removed by another scrubber. Next, triethylene glycol, a substance similar to the ethylene glycol used as antifreeze in automobile cooling systems, is used to remove water vapor from the gas via a process known as dehydration.



Odorizing

Natural gas is normally odorless. Its characteristic aroma is man-made for safety reasons and after its stay underground the gas loses some of its manufactured scent. To give it that characteristic odor so important in detecting leaks, we add a drop of chemicals (as much as one-half pint per million cubic feet) just before delivering the gas into our distribution lines.

Just as in storage injection, the signal to commence withdrawal of gas from storage is relayed to the field from our main gas control center. Withdrawal is usually ordered to meet heavy customer demand (1) throughout the cold, rainy winter season; (2) on air pollution episode days; or (3) during peak-load conditions when gas from storage augments the volumes constantly flowing in from out-of-state suppliers.

SOUTHERN CALIFORNIA GAS COMPANY'S UNDERGROUND STORAGE SITES

Southern California Gas Company, a subsidiary of Sempra Energy, operates four underground storage fields. Each facility has been developed due to unique geologic characteristics which makes it ideal for gas storage. The work done at these sites performs an essential function for all our gas customers in the Southern California area. We work to continue to meet our customers' needs in a safe and environmentally sound manner, thereby assuring the continuance of good neighbor relations with surrounding residents.

Aliso Canyon

Aliso Canyon has been the site of extensive oil and gas drilling since 1938. A storage site since 1972, the Aliso Canyon facility is found in the San Fernando Valley just above Northridge. Located in a remote, rugged area, the field covers some 3,600 acres (15 square kilometers).

Honor Rancho

Established as a Southern California Gas Company storage site in the mid-1970s, Honor Rancho is located in the northern part of Los Angeles County, about 35 miles (65 kilometers) northwest of down town Los Angeles.

La Goleta

Established in the early 1940s, the La Goleta site is located just southeast of the University of California at Santa Barbara campus in Goleta. The subsurface storage structure is a former natural gas reservoir that was developed in the late 1920s.

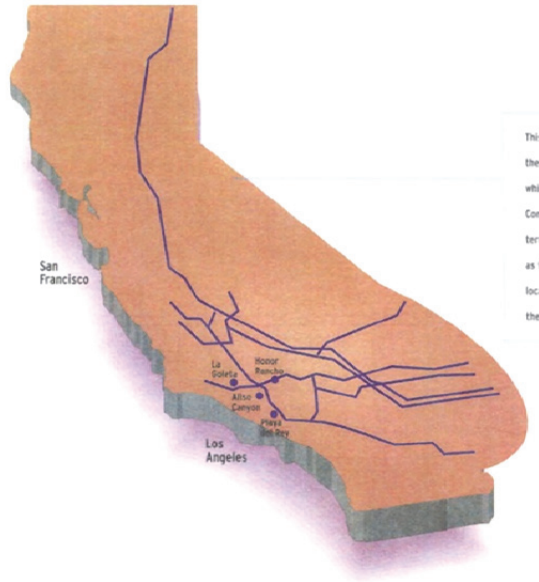
Playa del Rey

Located on the bluff overlooking Marina del Rey, the Playa del Rey site has been in operation since the mid-1940s. Storage operations began under the direction of the U.S. government to assure adequate gas supplies for the war effort. The Gas Company assumed ownership in the early 1950s.

A TRADITION OF SERVICE

Southern California Gas Company has a long tradition of providing dependable service to homes, businesses and industries in over 530 communities in a twelve-county area.

As the largest natural gas distribution company in the nation, we serve most of Central and Southern California. Providing reliable, safe and efficient natural gas service to meet this vast and fluctuating energy demand requires a highly responsive distribution system of more than 45,000 miles (83,000 kilometers) of gas main. The underground storage of natural gas plays a vital role in balancing the region's energy supply and demand.



This map shows the major pipelines which supply The Gas Company's service territory, as well as their strategic location relative to the storage fields.

Safety First

Safety has always been a top priority with us. The technology to monitor and operate an underground gas storage field has developed steadily through the years, and our facilities are in the forefront of safety controls and procedures. In addition, all of our operations are closely monitored for compliance with the safety standards of the California Public Utilities Commission, the Division of Oil and Gas, the Occupational Safety and Health Administration, and local fire departments.

FACTS ABOUT NATURAL GAS

Like other so-called "fossil fuels," such as coal and oil, natural gas was formed millions of years ago as a result of decomposition of plant and animal matter. Natural gas is often found in association with oil and is produced much the same way, by drilling wells into porous rock that contains it.

Natural gas has some important properties:

- It is colorless and odorless. We add the distinctive smell to natural gas as a safety precaution.
- It is lighter than air, which is an important built-in safety feature. If natural gas should escape outside, it will rise and dissipate harmlessly into the atmosphere.
- It is the cleanest burning of all hydrocarbon fuels.
- It will burn only when specific concentrations come in contact with an ignition source.

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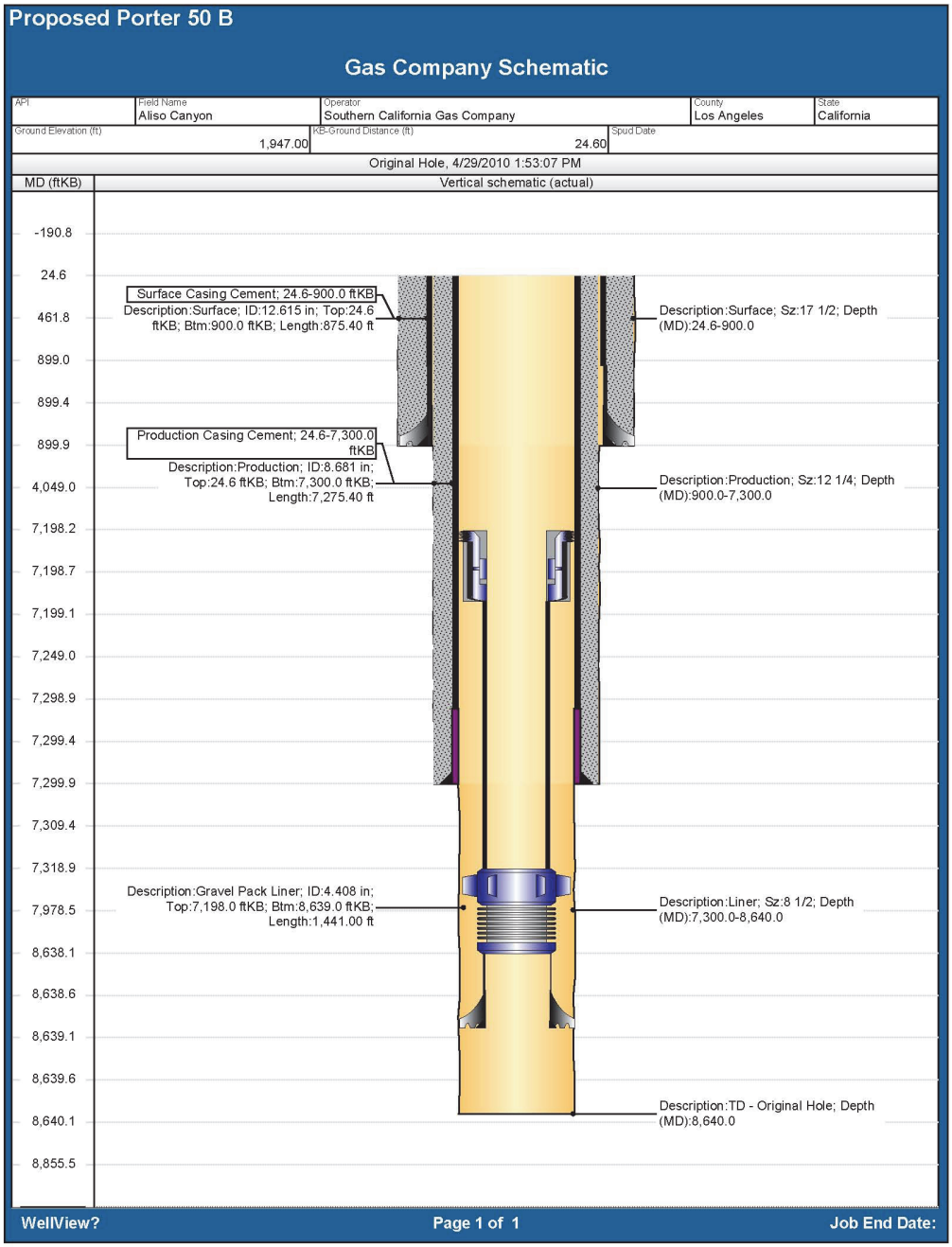
The Gas Company™

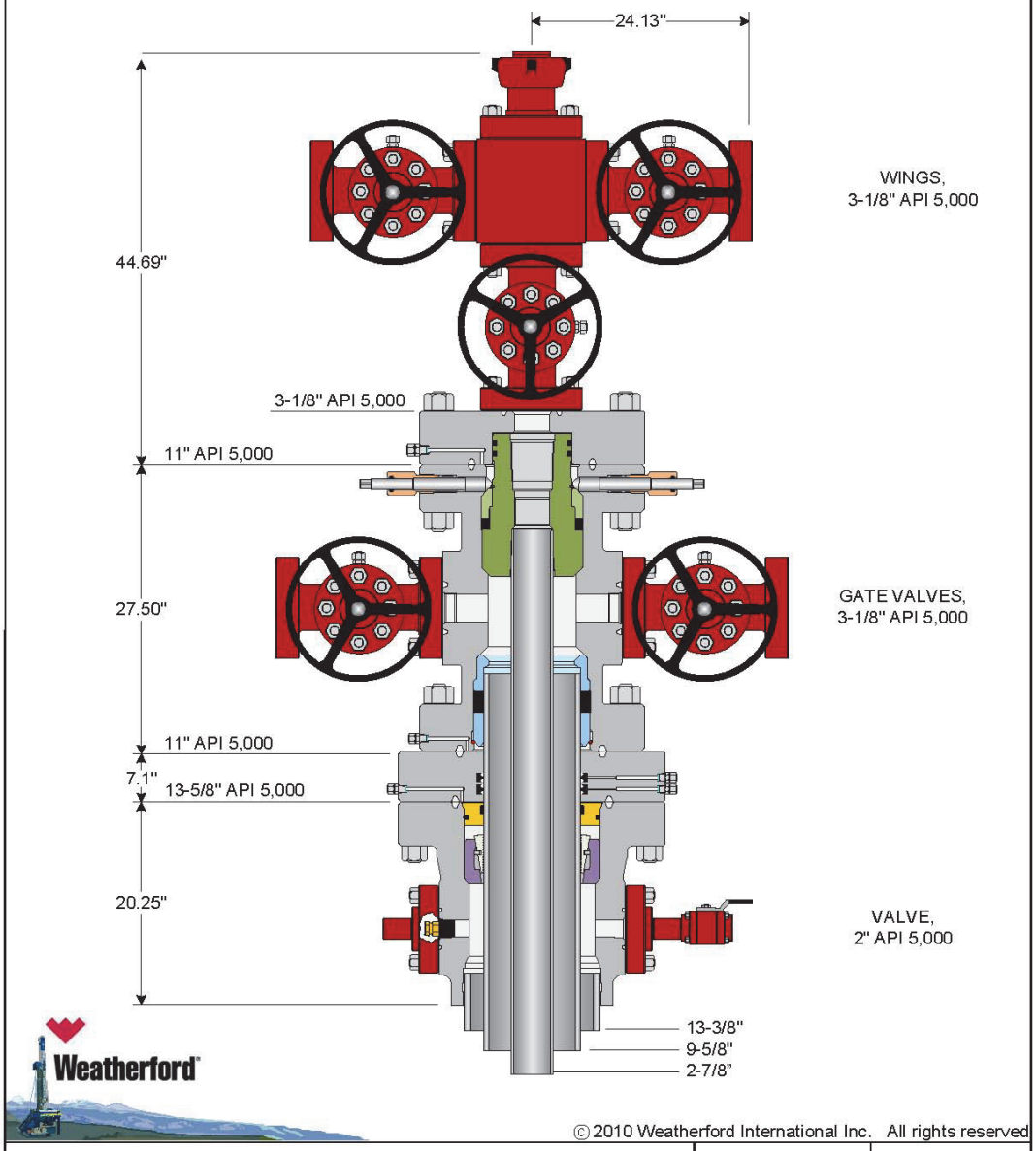
A Sempra Energy™ company

Appendix C

Downhole Schematic and Wellhead Diagram



THIS DRAWING IS NOT TO SCALE. THE DIMENSIONS REFLECTED ON THIS DRAWING ARE ESTIMATED DIMENSIONS AND ARE FOR REFERENCE ONLY.



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Customer: SOUTHERN CALIFORNIA GAS CO.	Project: TBD	Quote: TBD
Tender, Project or Well: ALISO CANYON – PORTER 50B	Date: 04-27-2010	Drawn By: JJ

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED JANUARY 17, 2017

RESPONSE DATED MARCH 13, 2017

SoCalGas provides the following response to the California Public Utilities Commission–Safety and Enforcement Division's January 18, 2017 request for information. This response is based upon the best available non-privileged information known at this time, and is subject to change and/or supplementation as SoCalGas' investigation continues, and additional information becomes available.

Question 3:

Provide dates of any casing leaks or breaches in casing for the life of the well.

a. Identify type of leak and well depth location

b. Provide method of leak mitigation, how was it stopped

c. Provide method of repair and repair report for each leak

d. Provide the assessed cause of the leak or casing breach

Response 3:

a. Please see the enclosed document with Bates range AC_CPUC_0036138 through AC_CPUC_0036139.

b. See Response 3a.

c. Please see the enclosed document with Bates range AC_CPUC_0036140 through AC_CPUC_0036510.

d. See Response 3a.

Question 5:

For wells currently not in natural gas operations, provide the,

a. Date of status change

b. To what status it was changed (P&A, observation, monitoring, etc.)

c. Reason for change

Response 5:

a. Please see the enclosed document with Bates range AC_CPUC_0036511 through AC_CPUC_0036412.

b. See Response 5a.

c. See Response 5a.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-68 DATED APRIL 8, 2020)

SOCALGAS RESPONSE DATED APRIL 20, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 8, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

The following questions are related to the document entitled, "Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company.

<u>QUESTION 1:</u>

Please refer to the table beginning on page 4 and continuing to page 6 for the following questions.

a. With regards to DOGGR Regulations, for each entry in this table that includes the words, "Not required", please confirm whether there is explicit wording that states that the subject area is not required, or whether Messrs. Hower and Stinson are

opining that they know of no such requirement. For example, the entries that state, "Dual barrier not required". Are there words in the DOGGR Regulations as of 10/23/2015 or is this opining that there is no such requirement called out in these documents?

b. For each entry in the table that does not have a reference, what is the page number and quoted passage that shows the support for the entry?
c. Identify each entry that has no document and passage to support it, and explain why there is not such support.
d. For reference to DOGGR regulations, identify the specific section of regulation that supports the entry.

RESPONSE 1:

SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "is this opining that there is no such requirement called out in these documents," and "what is the page number and quoted passage that shows support." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. The table beginning on page 4 and continuing to page 6 of Mr. Hower's and Mr. Stinson's testimony has been augmented in response to this data request and is provided below. A column was added to reflect whether or not specific language has been identified in the CalGEM (formerly DOGGR) regulations effective as of 10/23/15 and, if so, the reference section and language is provided. In some cases the regulation provides a general requirement and more specificity comes from the Aliso Canyon Project Approval Letter (PAL). An example of this is for pressure monitoring. The regulation, in §1724, gives the Division authority to ask for additional well-related information, and the PAL specifies that weekly surface pressures on each active or idle well should be measured and recorded.

In some cases, there are specific exclusions in the regulations that were directly applicable to Aliso Canyon. The reference section and applicable language is noted below. These include:

- a dual barrier well casing design
- production casing cement-to-surface
- emergency shutdown valves
- surface and subsurface safety valve testing

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-68 DATED APRIL 8, 2020)

SOCALGAS RESPONSE DATED APRIL 20, 2020

Where it is indicated that no specific language was identified, it is Mr. Hower's and Mr. Stinson's opinion that no such requirement existed in the regulations effective 10/23/15.

STORAGE ATTRIBUTE	DOGGR REGULATIONS	SPECIFIC LANGUAGE IDENTIFIED	DOGGR REFERENCE (Regulations effective October 2015)
Maximum Operating Pressure	Defined by permit (3,600 psi for Aliso)	**YES**	§1724.10(i) - "To determine the maximum allowable surface operating pressure . . ."
Mechanical Integrity Test - Original	Prior to commencing injection operations and if required within 3 months of initial operations	**YES**	§1724.10(j) - "A mechanical integrity test (MIT) must be performed on all injection wells to ensure the injected fluid is confined to the approved zone or zones." The Aliso Canyon Project Approval Letter (PAL) specifies ". . . within three months after injection and/or withdrawal has commenced.
Mechanical Integrity Test - Operations	Annual temperature surveys	**YES**	PAL specifies "A mechanical integrity test is made and filed with the Division . . . within three months after injection and/or withdrawal has commenced, at least once every year thereafter."
Well Casing Design	Dual barrier not required	**YES**	Specific language in §1724.10(g) - "All injection wells, except steam, air, and pipeline-quality gas injection wells, shall be equipped with tubing and packer . . ." **A dual barrier requires a tubing and packer completion, so by definition it is not required for gas storage wells.**
Cement Bond Log	Required	**YES**	§1722.4 ". . .the Division district deputy may require a cement bond log . . ."
Max Age of Storage Wells	None specified	**NO**	Note: The original table the Chapter I Reply Testimony dated March 20, 2020 indicated that the median age of repurposed wells is 7 years. This was a typo. The correct median age is 74 years.

Well Integrity Monitoring	Not required	**NO**	No requirement for casing inspection logs specified in regulations. Annual temperature logs are required by the PAL to monitor for downhole casing leaks.
Wellsite Inspections	Not specified	**NO**	
Pressure Monitoring	Surface pressures weekly	**YES**	§1724 Required Well Records (c) requires "Such information as the Supervisor may require for the performance of his or her statutory duties." As one of the additional data requirements specified in the PAL, measurement of weekly surface pressures on each active and idle well is required.
Reservoir Integrity Monitoring	Not required	**NO**	No requirement specified in regulations.
Production Casing Cement-to-Surface	Not required	**YES**	§1722.4 "Intermediate and production casings, if not cemented to the surface, shall be cemented with sufficient cement to fill the annular space to at least 500 feet above the oil and gas zones."
Emergency Shutdown Valves	Not required	**YES**	§1724.3. Requires well safety devices for Critical Wells only as defined in §1720(a) - "Critical well" means a well within:(1) 300 feet of the following:(A) Any building intended for human occupancy that is not necessary to the operation of the well; or(B) Any airport runway.(2) 100 feet of the following:(A) Any dedicated public street, highway, or nearest rail of an operating railway that is in general use;(B) Any navigable body of water or watercourse perennially covered by water;(C) Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population; or(D) Any officially recognized wildlife preserve.**No well at Aliso Canyon have been designated as a Critical Well, so this requirement does not apply.**

Surface and Subsurface Safety Valve Testing	Not required	**YES**	§ 1724.4 - Only required for safety devices installed as required in § 1724.3 for Critical Wells. **No well at Aliso Canyon have been designated as a Critical Well, so this requirement does not apply.**
Emergency Response Plan	Not required	**NO**	No general emergency response plan is required. § 1722.9 requires operators to have a Spill Contingency Plan. § 1722(c) provides that "for certain critical or high-pressure wells designated by the Supervisor, a blowout prevention and control plan . . . shall be submitted by the operator to the appropriate Division district deputy for approval." **No such blowout prevention and control plan was required by DOGGR in the PAL.**
Well Flow Testing	Not required	**NO**	No requirement specified in regulations.
Operation & Maintenance Procedures - Wells	Not required	**NO**	No requirement specified in regulations.
Risk Management Plan	Not required	**NO**	No requirement specified in regulations.
Well Kill System	Not required	**NO**	No requirement specified in regulations.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-74 DATED APRIL 13, 2020

SOCALGAS RESPONSE DATED MAY 7, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 13, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

The following questions are related to the document entitled, "Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company.

QUESTION 1:

On page 28, a passage states, "Prior to 2007, SoCalGas did assess risk as part of ongoing operations, even if it was not documented as a formal risk assessment program; this was consistent with the standard practices of other operators." Footnote 115 at the end of this passage states, "See eg., Ex. I-62 (Testimony of Phillip E. Baker,

Southern California Gas Company, 2016 General Rate Case, A.-14-11-004 at PEB-5 – PEB-8). Based upon this reference, please see the following passages from Ex.I-62.

a. In Ex. I-62, at PEB-5, a passage states, "While we have historically managed risk at our storage facilitated by relying on more traditional monitoring activities and identification of potential component failures, we believe that it is critical that we adopt a more proactive and in-depth approach. Historically, safety and risk considerations for wells and their associated valves and piping components have not been addressed in past rate cases to the same extent that distribution and transmission facilities have been under the Distribution and Transmission integrity management programs." With this passage in mind, please answer the following:
    1. Are there any SoCalGas policies, standards, procedures, protocols or other SoCalGas company documents that had been created at the time of Mr. Baker's testimony that showed that the company has "historically managed risk at our storage facilitated by relying on more traditional monitoring activities and identification of component failures."

    2. If the answer to question 1.a is yes, provide all such policies, standards, procedures, protocols or other SoCalGas company documents. Please include reference to the applicable pages and quote the passages that show what is requested in question 1a.

b. In Ex. I-62 at PEB-6, a passage states, "Currently, risk assessment of our storage system is of a qualitative nature and is based on our long experience in operating and managing SoCalGas' storage facilities. During routine system assessments, we monitor the condition of our assets and consider the risks they may pose on safety, reliability, and the environment."
    1. Are there any SoCalGas policies, standards, procedures, protocols or other SoCalGas company documents that had been created at the time of Mr. Baker's testimony that showed that ". . .[Risk assessment of our storage system is of a qualitative nature and is based on our long experience in operating and managing SoCalGas' storage facilities. During routine system assessments, we monitor the condition of our assets and consider the risks they may pose on safety, reliability, and the environment."

2. If the answer to question 2.a is yes, provide all such policies, standards, procedures, protocols or other SoCalGas company documents. Please include reference to the applicable pages and quote the passages that show what is requested in question 2.a.
3. Please refer to the passage on page 173 of the Blade Root Cause Analysis, indicating that SoCalGas made a recommendation in August 1988 to run casing inspection surveys and pressure test the casing in 20 Aliso Canyon wells used as casing flow wells [57] [58].1 SS-25 was on the list of wells and was considered a low priority well. Inspection surveys were run in seven of the 20 wells and included in all five high priority wells; five of the seven wells showed penetration of up to 60% in. Logs on two of the seven wells have not been located for review. Four of the five wells that showed numerous indications of wall loss above the surface casing shoe. Based on the high percentage of wells with significant penetration, the question remains as to why the remaining 13 wells were not inspected in the 2-year period as recommended. The Interoffice correspondence documents and additional details regarding the 20 wells are included in a separate report: Review of the 1988 Candidate Wells for Casing Inspection [59]. With this passage on mind, please answer the following:
   i. As part of SoCalGas's **"long experience in operating and managing SoCalGas' storage facilities"** did SoCalGas' alleged "risk assessment" in the passage in Ex. I-62, include inspection of or other actions related to the 13 wells in SoCalGas's August 1988 recommendation, as identified in the on page 173 of the Blade Root Cause Analysis?
   ii. If so, provide the documentation showing these things?
   iii. As part of SoCalGas's **"long experience in operating and managing SoCalGas' storage facilities"** did SoCalGas' alleged "risk assessment" in the passage in Ex. I-62, did that experience include any actions related to the five of seven wells that showed penetration of up to 60% as identified on page 173 of the Blade Root Cause Analysis?
   iv. If so, provide the documentation showing those actions.
   v. As part of SoCalGas's **"long experience in operating and managing SoCalGas' storage facilities"** did SoCalGas' alleged "risk assessment" experience in the passage in Ex. I-62, include

any actions related to the seven wells that had inspection surveys?

vi. If so, provide the documentation showing these actions.

c. Does the Hower/Stinson testimony rely completely on Mr. Baker's testimony for its discussion of SoCalGas's risk assessment prior to 2007?

d. If so, why is Mr. Phil Baker not offered as a witness for this purpose?

RESPONSE 1:

a.

1. SoCalGas objects to this request as overly broad and unduly burdensome, including to the extent it does not specify a timeframe to which SoCalGas may tailor its response. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "that had been created at the time of Mr. Baker's testimony." It is not clear whether this request is asking for "policies, standards, procedures, protocols or other [] company documents" that were in effect at the time of Mr. Baker's testimony or that had been created prior to Mr. Baker's testimony. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. The historical risk management practices referenced by Mr. Baker in his GRC testimony are comprised of monitoring practices which are captured in SoCalGas' company standards. For example, see SoCalGas Gas Standard 224.0070. The version of Gas Standard 224.0070 applicable as of October 23, 2015 was previously provided in Bates range AC_CPUC_SED_DR_27_0000117 through AC_CPUC_SED_DR_27_0000131. SoCalGas also previously produced SoCalGas' Gas Standards relating to operating and managing field wells at Aliso Canyon from 1979 through October 23, 2015 on April 24, 2019. (See electronic documents with Bates range AC_CPUC_SED_DR_38_0000003 – AC_CPUC_SED_DR_38_0147786).
2. SoCalGas objects to this request to the extent it is overly broad, unduly burdensome, and seeks documents already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See response to Question 1a1.

b.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-74 DATED APRIL 13, 2020

SOCALGAS RESPONSE DATED MAY 7, 2020

1. SoCalGas objects to this request as overly broad and unduly burdensome, including to the extent it does not specify a timeframe to which SoCalGas may tailor its response. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "that had been created at the time of Mr. Baker's testimony." It is not clear whether this request is asking for "policies, standards, procedures, protocols or other [] company documents" that were in effect at the time of Mr. Baker's testimony or that had been created prior to Mr. Baker's testimony. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets "policies, standards, procedures, protocols or other [] company documents" as asking for formal documentation showing a risk assessment policy, excluding testimony provided in General Rate Cases. No. SoCalGas notes its Prepared Reply Testimony, Chapter I (Hower/Stinson), p. 28: "[P]rior to 2007 SoCalGas did assess risk as part of ongoing operations, *even if it was not documented as a formal risk assessment program*; this was consistent with the standard practices of other operators." (Emphasis added).
2. SoCalGas objects to this request to the extent it is overly broad and unduly burdensome. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see response to 1(b)(1).
3. SoCalGas objects to requests 1(b)(3) (subsections (i) through (vi) inclusive) to the extent these requests are vague and ambiguous, particularly with respect to the references to "[57] [58]" and "[59]" to the extent there is no indication to what these numbers refer. SoCalGas also objects to this request as overly broad and unduly burdensome to the extent it does not specify any timeframe to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek information prior to 2007.
    i. SoCalGas objects to this request as unintelligible. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "alleged 'risk assessment'" and "other actions." Subject to and without waiving the foregoing objections, SoCalGas responds as

follows. SoCalGas interprets this question to ask whether the 13 wells in SoCalGas' 1988 memo were regularly monitored in accordance with SoCalGas' gas standard referenced in response to 1(a)(1). Yes.

ii. SoCalGas objects to this request to the extent it seeks information already provided to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Documentation is maintained in the individual well files, which have been previously provided to SED.

iii. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "alleged 'risk assessment,'" and "any actions." SoCalGas further objects to this request to the extent it is argumentative and unintelligible. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this question to ask whether the 5 of 7 wells that showed penetration of up to 60% as identified on page 173 of the Blade Root Cause Analysis were regularly monitored in accordance with SoCalGas' gas standard referenced in response to 1(a)(1). The five of seven wells that showed penetration of between 20-60% as determined by the Blade RCA were regularly monitored in accordance with the gas standards as referenced in response to 1(a)(2).

iv. Documentation is maintained in individual well files which have been previously provided to SED.

v. SoCalGas objects to this request to the extent it is unintelligible, and vague and ambiguous, particularly with respect to the phrases "alleged 'risk assessment,'" and "any actions." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this question to ask whether the 7 wells that had inspection surveys memo were regularly monitored in accordance with SoCalGas' gas standard referenced in response to 1(a)(1). The seven wells that had inspection surveys were regularly monitored in accordance with the gas standards as referenced in response to 1(a)(2).

vi. Documentation is maintained in individual well files which have

been previously provided to SED.

c. SoCalGas objects to this request to the extent it seeks information that is protected by the attorney-client privilege or attorney work product doctrine. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No. The testimony provided in Chapter 1 of SoCalGas' Reply Testimony was based on various sources including the testimony of Philip Baker in 2014, a review of numerous documents and interviews and discussions with SoCalGas personnel. The documents include, inter alia, those well files discussed and cited to on pages 12 – 17 of Chapter I of SoCalGas' Prepared Reply Testimony.
d. SoCalGas objects to this request to the extent it is argumentative, seeks information outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019, and seeks information protected by the attorney work product doctrine and/or the attorney-client privilege. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A. See Response 1 (c).

QUESTION 2:

On pages 28 and 29, it states, "Second, starting in 2007 SoCalGas had a formal risk assessment program, which focused on wellbore integrity management. SoCalGas implemented a "Replace and Inspect" initiative, which included conducting wellbore integrity evaluations at Aliso Canyon and performing remedial work, if necessary, based on the results. SoCalGas implemented the initiative two years prior to Mr. Mansdorfer's 2009 recommendation for a similar initiative. The initiative included the inspection of the integrity of the production casing in the storage wells. Moreover, the "Replace and Inspect" initiative included detailed evaluations of the wellbore integrity and replacement of well hardware equipment, such as wellhead valves and the well tubing and packer. As a result of this initiative, SoCalGas permanently removed six wells, of approximately 30 wells inspected, from service based on their downhole condition." With this passage in mind, please answer the following:

a. Please provide all documentation showing each fact asserted in this paragraph. Please include page number and quote all passages that SoCalGas claims are in support.
b. Please refer to the passage on page 173 of the Blade Root Cause Analysis,

SoCalGas made a recommendation in August 1988 to run casing inspection surveys and pressure test the casing in 20 Aliso Canyon wells used as casing flow wells [57] [58].2 SS-25 was on the list of wells and was considered a low priority well. Inspection surveys were run in seven of the 20 wells and included in all five high priority wells; five of the seven wells showed penetration of up to 60% in. Logs on two of the seven wells have not been located for review. For of the five wells showed numerous indications of wall loss above the surface casing shoe. Based on the high percentage of wells with significant penetration, the question remains as to why the remaining 13 well were not inspected in the 2-year period as recommended. The Interoffice correspondence documents and additional details regarding the 20 wells are included in a separate report: Review of the 1988 Candidate Wells for Casing Inspection [59].

i. Did SoCalGas's **formal risk assessment program that began in 2007, or its implemented "Replace and Inspect" initiative,** include inspection or any other actions related to the 13 wells in SoCalGas's August 1988 recommendation, as identified in the on page 173 of the Blade Root Cause Analysis?
ii. If so, provide the documentation showing this.
iii. Did SoCalGas's **formal risk assessment program that began in 2007, or its implemented "Replace and Inspect" initiative,** include any actions related to the five of seven wells that showed penetration of up to 60% as identified in the on page 173 of the Blade Root Cause Analysis?
iv. If so, provide the documentation showing these actions.
v. Did SoCalGas's **formal risk assessment program that began in 2007, or its implemented "Replace and Inspect" initiative**, include any actions related to the seven wells that had inspection surveys?
vi. If so, provide the documentation showing these actions.

RESPONSE 2:

a. SoCalGas objects to this request as overly broad and unduly burdensome to the extent it does not specify a timeframe to which SoCalGas may tailor

its response. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The above quote is based on a review of documents as well as interviews or discussions with various SoCalGas personnel.

b.

i. SoCalGas objects to this request as unintelligible. SoCalGas further objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "alleged 'risk assessment'" and "other actions." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.

ii. Please see previously provided well files for SS-6, SS-7, and SS-10.

iii. SoCalGas objects to this request as unintelligible. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "alleged 'risk assessment'" and "other actions." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.

iv. Please see previously provided well files for P-37 and SS-8.

v. SoCalGas objects to this request as unintelligible. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "alleged 'risk assessment'" and "other actions." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.

vi. Please see previously provided well files for P-37 and SS-8.

QUESTION 3:

On page 29, it states, "Second, in 2014, SoCal Gas improved upon the "Replace and Inspect" initiative by developing the Storage Integrity Management Program ("SIMP"). SoCalGas was in the process of initiating the SIMP at the time of the SS-25 incident. For gas storage wells, SIMP includes threat identification and risk assessment based on a variety of factors, remediation as necessary, development of preventative and mitigative measures, and record-keeping requirements. Essentially, SIMP is combines risk management and integrity management into an aggressive integrity management program that addresses risk more proactively."

This passage is followed by a footnote that references the following passage, "For example, Ravi Krishnamurthy from Blade described SoCalGas' SIMP program as being 'intense.' Ex. I-63 at 340:7-15 (Krishnamurthy Depo. Tr. 340:7-15)." With this passage in mind, please answer the following:

a. Provide all documentation showing each fact asserted in this passage. Please include page number and quote all passages that SoCalGas claims are in support.
b. Please refer to the passage on page 173 of the Blade Root Cause Analysis, SoCalGas made a recommendation in August 1988 to run casing inspection surveys and pressure test the casing in 20 Aliso Canyon wells used as casing flow wells [57] [58]. SS-25 was on the list of wells and was considered a low priority well. Inspection surveys were run in seven of the 20 wells and included in all five high priority wells; five of the seven wells showed penetration of up to 60% in. Logs on two of the seven wells have not been located for review. For of the five wells showed numerous indications of wall loss above the surface casing shoe. Based on the high percentage of wells with significant penetration, the question remains as to why the remaining 13 well were not inspected in the 2-year period as recommended. The Interoffice correspondence documents and additional details regarding the 20 wells are included in a separate report: Review of the 1988 Candidate Wells for Casing Inspection [59].
    i. Did SoCalGas's SIMP, include inspection or any other actions related to the 13 wells in SoCalGas's August 1988 recommendation, as identified in the on page 173 of the Blade Root Cause Analysis?
    ii. If so, provide the documentation showing this.
    iii. Did SoCalGas's SIMP, include any actions related to the five of seven wells that showed penetration of up to 60% as identified in the on page 173 of the Blade Root Cause Analysis?
    iv. If so, provide the documentation showing these actions.
    v. Did SoCalGas's SIMP, include any actions related to the seven wells that had inspection surveys?
    vi. If so, provide the documentation showing these actions.

RESPONSE 3:

a. SoCalGas objects to this request to the extent it is compound and unintelligible in that it requests "documentation showing each fact asserted in this passage." SoCalGas further objects to this request to the extent it overly broad and unduly burdensome, including to the extent it does not specific a timeframe to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek SoCalGas' first testimony related to SIMP program. Please refer to the following link which includes the 2016 General Rate Case (A.14-11-004) testimony and accompanying workpapers of SoCalGas witness Phillip E. Baker: https://www.socalgas.com/regulatory/A1411004. Please also see SoCalGas Prepared Reply Testimony, Chapter VI (Kitson) at 2-4.
b. SoCalGas objects to requests 3(b)(i) through 3(b)(vi) to the extent these requests are vague and ambiguous, particularly with respect to the phrases "[57] [58]" and "[59]" as it is unclear to what these numbers refer, "For of the five wells . . ." and "the remaining 13 well."

    i. SoCalGas objects to this request as unintelligible. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "any other actions related to." SoCalGas further objects to this request to the extent it seeks information already provided or otherwise available to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.
    ii. Please see previously provided well files for P-44, P-47, SS-2, SS-4, SS-6, SS-10, SS-11, SS-17, SS-24, and SS-29.
    iii. SoCalGas objects to this request as unintelligible. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "include any actions related to." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.
    iv. Please see previously provided well files for F-4, P-37, P-46,

and SS-9.

v. SoCalGas objects to this request as unintelligible. Further, SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrases "include any actions related to." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.

vi. Please see previously provided well files for F-4, P-37, P-46, SS-9, F-2, and P-34.

QUESTION 4:

Please refer to the witness qualifications that show why Messrs. Hower and Stinson are qualified to provide the answers to the questions in this data request.

RESPONSE 4:

SoCalGas objects to this request on the ground it fails to ask any question.

QUESTION 5:

Provide documentation in support of the answers to question 4.

RESPONSE 5:

SoCalGas objects to this request to the extent it is unintelligible, particularly in reference to a request to which no response is sought.

QUESTION 6:

Please list all of the SoCalGas documents that were provided to, and reviewed by, Messrs. Hower and Stinson before they wrote their testimony.

RESPONSE 6:

SoCalGas objects to this request to the extent it is overly broad and unduly burdensome

to the extent it does not specify a timeframe to which SoCalGas may tailor its response. SoCalGas interprets this request as asking for a list of documents reviewed by Messrs. Hower and Stinson in connection with their sponsored Reply Testimony submitted in CPUC proceeding I.19-06-016. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to Exhibits I-1 through I-72 of SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson). SoCalGas is reviewing its records and will provide a supplemental response if it identifies documents responsive to this request.

QUESTION 7:

With regards to the witness qualifications of Mr. Stinson, witness qualification 10 states, "Additionally, I headed up teams of gas storage professionals to perform risk assessments for two gas storage facilities in the western U.S. in compliance with new regulations for underground gas storage." With this in mind, please answer.

a. When did Mr. Stinson do this?
b. In which states are the two gas storage facilities in the western U.S. that the passage refers?
c. Has Mr. Stinson had any experience with regards to risk assessments for gas storage facilities in California?
d. If so, please describe.

RESPONSE 7:

a. Mr. Stinson headed his first team in 2016 and his second team in 2018.
b. Oregon and California.
c. Yes.
d. Mr. Stinson led and was the primary author of a risk assessment performed in California.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-76 DATED APRIL 14, 2020

SOCALGAS SUPPLMENTAL RESPONSE DATED JUNE 19, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 14, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

For this set of questions, please refer to the document entitled "Chapter I Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company.

QUESTION 1:

Please refer to the following passage on pages 35 and 36.

"SED's testimony regarding real time pressure monitoring ("RTPM") is unclear. At deposition, SED's witness clarified that the reason RTPM was important was that it

could have enabled SoCalGas to identify and remediate the leak at SS-25, which she believes had been present for years at an earlier point in time. [Footnote omitted.] The facts, however, are otherwise: the leak and failure at SS-25 was a sudden event and there was no pre-existing leak. Ms. Felts testimony on this issue is also inconsistent with Blade's report. As such SED's contention here is simply without any factual basis or support." With this passage in mind, please answer the following:

- **a.** Provide all documentation that shows the assertion in this passage that "the leak and failure at SS-25 was a sudden event and there was no pre-existing leak."
- **b.** Regarding the statement that, "Ms. Felts testimony on this issue is also inconsistent with Blade's report.", cite to the exact pages and quote the exact excerpts from Blade's report, and from Ms. Felts's testimony that are allegedly inconsistent with one another.
- **c.** Is it SoCalGas's contention that real time pressure monitoring (RTPM) cannot detect leaks in wells such as SS-25?
- **d.** If so, provide all such documentation, including pages and quoted passage that support such a contention.
- **e.** Is it SoCalGas's contention that if it had used RTPM in well SS-25 prior to October 23, 2015, it would not have detected a leak?
- **f.** Prior to October 23, 2015, did SoCalGas have any internal communications or correspondence in which the use of RTPM was recommended on any of its wells at Aliso Canyon natural gas storage facility?
- **g.** If so, provide all such communications and/or correspondence. Include reference to appropriate page numbers and show exact quotes.
- **h.** Prior to October 23, 2015, did SoCalGas have any internal communications or correspondence identifying concerns with not using RTPM on any of its wells at Aliso Canyon natural gas storage facility?
- **i.** If so, provide all such communications and/or correspondence. Include reference to appropriate page numbers and show exact quotes.

<u>RESPONSE 1h (DATED APRIL 24, 2020):</u>

h. SoCalGas objects to this request to the extent it is overly broad and burdensome to the extent that it does not specify a timeframe to which SoCalGas may tailor its response. SoCalGas further objects to this request to the extent that is seeks information that is protected by the attorney-client privilege or attorney work product doctrine. Subject to and without waiving the foregoing objections,

SoCalGas responds as follows. SoCalGas is reviewing its records and will provide a supplemental response if it identifies documents responsive to this request.

SUPPLEMENTAL RESPONSE 1h (DATED JUNE 19, 2020):

SoCalGas reincorporates herein its objections to Question 1 as provided in SoCalGas' April 24, 2020 Response to SED. As detailed in SoCalGas' April 24, 2020 Response to Question 1h, SoCalGas stated that it would supplement this response if it identified responsive documents. Subject to and without waiving the prior objections, SoCalGas responds as follows.

To locate documents where SoCalGas had internal communications or correspondence identifying concerns with not using RTPM on any of its wells at Aliso Canyon natural gas storage facility prior to October 23, 2015, SoCalGas reviewed records related to Aliso Canyon, dated prior to October 23, 2015, and which included the following key terms:

- "well site enhancement project" AND Aliso; or,
- "continuous pressure monitoring" AND Aliso; or,
- "real time pressure monitoring" (limited to .msg); or,
- SCADA and "continuous pressure monitoring"; or,
- SCADA AND "pressure" AND "aliso" (limited to .msg); or,
- interoffice w/2 (memorandum or correspondence)) AND (((real time OR real-time OR realtime OR continuous* OR continual* OR constant*) w/5 pressure) OR RTPM AND Aliso; or,
- RTPM SCADA AND "pressure" AND "aliso" (limited to .msg

For responsive documents, please see documents with bates numbers I1906016_SCG_SED_DR_76_0000001 - 00075.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST CAL ADVOCATES-SCG-38 DATED APRIL 14, 2020

SOCALGAS RESPONSE DATED APRIL 24, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 14, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

For this set of questions, please refer to the document entitled "Chapter I Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company.

QUESTION 1:

Please refer to the following passage on pages 35 and 36.

"SED's testimony regarding real time pressure monitoring ("RTPM") is unclear. At deposition, SED's witness clarified that the reason RTPM was important was that it

could have enabled SoCalGas to identify and remediate the leak at SS-25, which she believes had been present for years at an earlier point in time. [Footnote omitted.] The facts, however, are otherwise: the leak and failure at SS-25 was a sudden event and there was no pre-existing leak. Ms. Felts testimony on this issue is also inconsistent with Blade's report. As such SED's contention here is simply without any factual basis or support." With this passage in mind, please answer the following:

- **a.** Provide all documentation that shows the assertion in this passage that "the leak and failure at SS-25 was a sudden event and there was no pre-existing leak."
- **b.** Regarding the statement that, "Ms. Felts testimony on this issue is also inconsistent with Blade's report.", cite to the exact pages and quote the exact excerpts from Blade's report, and from Ms. Felts's testimony that are allegedly inconsistent with one another.
- **c.** Is it SoCalGas's contention that real time pressure monitoring (RTPM) cannot detect leaks in wells such as SS-25?
- **d.** If so, provide all such documentation, including pages and quoted passage that support such a contention.
- **e.** Is it SoCalGas's contention that if it had used RTPM in well SS-25 prior to October 23, 2015, it would not have detected a leak?
- **f.** Prior to October 23, 2015, did SoCalGas have any internal communications or correspondence in which the use of RTPM was recommended on any of its wells at Aliso Canyon natural gas storage facility?
- **g.** If so, provide all such communications and/or correspondence. Include reference to appropriate page numbers and show exact quotes.
- **h.** Prior to October 23, 2015, did SoCalGas have any internal communications or correspondence identifying concerns with not using RTPM on any of its wells at Aliso Canyon natural gas storage facility?
- **i.** If so, provide all such communications and/or correspondence. Include reference to appropriate page numbers and show exact quotes.

RESPONSE 1:

a. Please see Blade Report at 31 ("No temperature, pressure, or noise anomalies in the surveys indicated a preexisting casing failure before the incident of October 23, 2015. Additionally, no physical observations from well inspections and weekly pressure measurements indicated an existing casing integrity problem."); at 52 ("Tearing instability occurred once the axial flaw reached the critical size,

followed by rapid crack propagation in the axial direction"); at 183 ("[T]he 7 in. production casing ruptured suddenly during gas injection operations."); and at 198 ("Numerous temperature, noise, and pressure surveys were run in SS-25 between the years of 1974 and 2014, and no major anomalies were found indicating fluid migration."). See also Blade Report, Volume 2, at 138 ("The internal pressure caused slow ductile tearing of the thinnest region. A crack formed in the 2.13 in. origin, at which point tearing instability occurred, followed by a rapid crack propagation that left chevron marks behind.").

b. See response to question 1a. See also Felts. Depo. Tr. 268:23-24 ("If they had been able to detect a smaller leak first, . . ."); at 269:14-17 ("[I]t's possible they might have picked up a problem earlier, maybe even weeks earlier, through regular monitoring"); and at 271:19-22 ("[T]he real-time monitoring system would have probably prevented the blowout because they would have detected the leak at a lesser amount and shut in the well").
c. SoCalGas objects to this request as vague and ambiguous with regards to the phrase "detect leaks." SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (MHA) and Chapter II (Carnahan). Subject to and without waiving the foregoing objections, SoCalGas responds as follows. This is not SoCalGas' contention. SoCalGas' contention(s) regarding real-time pressure monitoring is described in Reply Testimony, Chapter I, pp. 38-40 and Chapter II, pp. 23-27.
d. N/A.
e. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "detected a leak." SoCalGas further objects to this request to the extent it is argumentative in implying that a leak existed at SS-25 prior to October 23, 2015. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes, this is SoCalGas' contention. See above response to question 1(a).
f. SoCalGas objects to this request as overly broad and burdensome to the extent that it does not specify a timeframe to which SoCalGas may tailor its response. SoCalGas further objects to this request to the extent that it seeks information that is protected by the attorney-client privilege or attorney work product doctrine. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. At the time of the SS-25 incident, SoCalGas had purchased and installed a real-time pressure monitoring system at its La Goleta storage field and was in the process of installing real-time pressure monitoring systems at its other

storage facilities. SoCalGas is reviewing its records and will provide a supplemental response if it identifies documents responsive to this request.

g. See Reply Testimony, Chapter I (Hower/Stinson), p. 37 (Noting that "[a]t the time of the SS-25 incident, SoCalGas had purchased and was in the process of installing SCADA for their wells at each of their gas storage facilities, but the system at Aliso Canyon had not yet been installed.")
h. SoCalGas objects to this request to the extent it is overly broad and burdensome to the extent that it does not specify a timeframe to which SoCalGas may tailor its response. SoCalGas further objects to this request to the extent that is seeks information that is protected by the attorney-client privilege or attorney work product doctrine. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas is reviewing its records and will provide a supplemental response if it identifies documents responsive to this request.
i. See response to Question 1(g).

QUESTION 2:

Please refer to the following passage on page 36: "Ms. Felts also appears to be arguing separately that RTPM would have provided flow rate data that could have been utilized in the well kill. [Footnote 143] As a general matter, SED's allegations regarding real time pressure monitoring, and the Blade analysis on which it appears to be based, are highly speculative." Footnote 143 then references pages 270 through the beginning of 272 of Ms. Felts's deposition transcripts, which provide in part the following on pages 271 to 272:

Q So what would a continuous real-time pressure monitoring system have provided that they couldn't have collected prior to the blowout?

A The way I connect this is that the real-time monitoring system would have probably prevented the blowout because they would have detected the leak at a lesser amount and shut in the well; so they would have had their readings at that point in time. But if they shut in the well, they wouldn't have to use the readings.
With these passages in mind, please answer the following:

a. Does SoCalGas assert that the real-time monitoring system would not have

detected a leak in well SS-25?

b. If so, please provide the basis for this assertion.

c. Prior to October 23, 2015, had SoCalGas attempted to detect leaks on any of its Aliso Canyon Natural Gas Storage facility wells using a continuous real time pressure monitoring system?

d. Prior to October 23, 2015, had SoCalGas attempted to detect leaks on any of its natural gas wells using a continuous real time pressure monitoring system?

e. If the answer to question 2c is yes, identify the wells by name and specify how many leaks were detected at each identified well each year.

f. If the answer to question 2d is yes, how many leaks were detected in each natural gas well each year?

g. Provide documentation, including page reference and quotes to the proper passages supporting the responses to each answer.

RESPONSE 2:

a. SoCalGas objects to this request to the extent it is repetitive of Question 1(e). Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see response to Question 1(e).

b. SoCalGas objects to this request to the extent it is repetitive of Question 1(e). Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see response to Question 1(e).

c. SoCalGas objects to this request as vague and ambiguous with respect to the phrase "attempted to detect leaks." Further, SoCalGas objects to this request to the extent that it assumes facts regarding the purpose of pressure monitoring. Subject to and without waiving the foregoing objections, SoCalGas responds as follows: See responses to questions 1f and 1g.

d. SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas further objects to this request to the extent it assumes facts regarding the purpose or capabilities of pressure monitoring. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See response to 1f above.

e. N/A.

f. N/A.

g. N/A.

QUESTION 3:

Refer to the following passage on page 37: "At the time of the SS-25 incident, SoCalGas had purchased and was in the process of installing SCADA for their wells at each of their gas storage facilities, but the system at Aliso Canyon had not yet been installed." With this passage in mind, please answer:

a. For which of SoCalGas's gas storage facilities had SoCalGas installed SCADA as of October 23, 2015?
b. Provide documentation supporting this answer.

RESPONSE 3:

a. SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to question 1(a) and previously produced electronic documents with Bates range I1906016_SCG_SED_DR_59_0000004 through I1906016_SCG_SED_DR_59_0000057, which include documents related to the SIMP pilot program and excerpts from the 2014-2016 GRC Spending Accountability Report.
b. See response to question 3(a).

QUESTION 4:

Refer to the following passage on pages 38 and 39: "Real-Time Pressure Monitoring Would Neither Have Provided a Meaningfully More Immediate Identification of the Leak, Nor Would It Have Provided Insight into the Extent of the Leak. The SED testimony states the following:

The lack of real-time pressure measurements prevented the immediate identification of the SS-25 7-inch casing failure." [Footnote omitted.] SED further states that "[i]f this type of system had been installed on SS-25, it would have provided insight into the time of the leak, the opportunity to shut in the well immediately, size of the leak, and the extent

of the problem." [Footnote omitted.]

The above SED statements, which are copied directly from the Blade report with no further comment, analysis or insights, are incorrect and irrelevant. SED alleges that if a SCADA system were installed, it would have provided insight into the time of the leak and the opportunity to shut-in the well immediately. [Footnote omitted.] That SoCalGas could have somehow stopped the failure mid-rupture is pure speculation, lacks factual support, and belies credulity. [Footnote omitted.] Blade estimates the time of the leak at between 7am and 8am on October 23, 2015. [Footnote omitted.] SoCalGas discovered the leak at 3:15pm that same day, and shut-in the well by 3:30pm that same day. For all intents and purposes, SoCalGas, through their regular well monitoring, discovered the leak and shut-in the well almost immediately. A few hours difference in the initial identification of the gas leak and the closing of the well would have made absolutely no difference to the actions and outcome at the SS-25 well." (Emphasis in original.)

With this passage in mind, please answer the following:

- **a.** If there was a leak on well SS-25 before the pipe ruptured, please confirm that this passage assumes that a properly functioning SCADA system would not have detected a leak when it first occurred and explain why.
- **b.** Does SoCalGas have a SCADA system for all of or any portion of its natural gas transmission system?
- **c.** If so, when was that SCADA system installed and made operational?
- **d.** What is the technology difference between SCADA installed at wells and SCADA installed on a transmission system that would make installation at wells not possible until after 2000 as suggested on page 37??
- **e.** Provide documentation, including page references and quotes to applicable passages in support of these answers.

<u>RESPONSE 4:</u>

a. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (MHA). Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No, this passage does not assume that a properly functioning SCADA system would not have detected a leak when it first

occurred.

b. SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019.
c. SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019.
d. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (MHA) at page 37. SoCalGas further objects to this request to the degree that it is vague and ambiguous with respect to "technology difference." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas' Prepared Reply Testimony, Chapter 1 (MHA), p. 37, does not contend that it was not possible to install SCADA on gas storage wells prior to 2000 due to any technological limitations.
e. SoCalGas objects to this request as overly broad and unduly burdensome. Subject to and without waiving the foregoing objection SoCalGas responds as follows. See Reply Testimony, Chapter 1, p. 37 ("Our experience indicates that even today less than half of all gas operators have full SCADA capability. . . Most gas storage operators now have SCADA systems for their compressor station(s) and central control facility operation, but as of 2015 very few gas storage fields that were developed in depleted oil or gas fields had retrofitted their storage wells with this capability."). See also Reply Testimony, Chapter 1, Exs. I-70 and I-71.

QUESTION 5:

Please refer to the following passage on page 39.

"SED further alleges that if a SCADA system were installed, it would have provided insight into the size of the leak. Presumably, by the "size of the leak", SED (and Blade) mean the gas flow rate of the leak. But this is impossible. A SCADA system would have provided no information at all as to the magnitude of the gas leak. A SCADA system measures surface tubing and casing pressures and, if equipped with a well flow meter, the injection or production rate at the wellhead. At the time of the leak, the SS-25 well was injecting gas at a rate of approximately 70 MMscf per day. That is the rate that the

SCADA system would have measured, and that rate has absolutely nothing to do with the magnitude of the downhole gas leak. Once the well was shut-in, the gas injection rate would now be zero, but the SCADA system would still not be measuring any flow rate associated with the gas leak because the SCADA system measures data at the wellhead. As the Blade report states, most of the gas from the leak would have 'flowed through the heavily weathered and vertically fractured top 200-300 ft. of formation, however, some would have flowed horizontally through permeable or fractured layers away from the SS- 25 well site, and some would have remained in the subsurface.' It is not possible for a real-time measurement system at the wellhead to detect and measure the gas flow rate outside the wellhead flowing through the geologic strata.

The SED allegations in respect of SCADA are unfounded. SCADA on individual wells was not an industry standard in 2015 in gas storage fields developed in depleted oil and gas fields (80% of the U.S. gas storage fields). SCADA would not have yielded any useful information as to the location or extent of the gas leak in the SS-25 well. And, most importantly, a SCADA system would have made absolutely no difference in the events that transpired at the SS-25 well on October 23, 2015 and thereafter."

a. Is it SoCalGas's contention that a SCADA system cannot monitor well tubing and casing pressures?
b. If so, explain why not.
c. If so, provide documentation that shows this.

<u>RESPONSE 5:</u>

a. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I at p. 39. Subject to and without waiving the foregoing objection SoCalGas responds as follows. No, SoCalGas does not contend that SCADA system cannot monitor well tubing and casing pressure.
b. N/A.
c. N/A.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-75 DATED APRIL 13, 2020

SOCALGAS RESPONSE DATED MAY 5, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 13, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

The following questions are related to the document entitled, "Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company.

QUESTION 1:

Please refer to page 21, and the passage that states: "Given that the purpose of the surface casing is to protect groundwater zones during the initial drilling and completion of the well, which was done in 1953 and 1954, and that the oversight of the surface

casing operation was reviewed and approved by the DOGGR, there really is no reason for SoCalGas to have a "reasonable understanding of the groundwater depths relative to the surface casing shoe and production casing of well SS-25" as is alleged by in the SED testimony".

With this passage in mind, please answer the following:

a. Provide the documentation that shows that "the oversight of the surface casing operation was reviewed and approved by the DOGGR."
b. If SoCalGas cannot provide such documentation, please say so.
c. Assume hypothetically that DOGGR did review and approve the oversight of the surface casing operation for this question. Is it then SoCalGas's position that once DOGGR approves and reviews oversight of operation, such as but not limited to surface casing, that SoCalGas never needs to check the field conditions, such as groundwater depths, relative to elements of a natural gas well, such as but not limited to the surface casing shoe and production casing of well SS-25?
d. Is the purpose of the surface casing only to protect groundwater zones during initial drilling and completion of the well? That is, in your expert opinion, the surface casing is not meant to protect groundwater zones throughout the life of the well? This question assumes that by "protect groundwater zones" you mean to protect the casing against groundwater contact/intrusion. Please clarify whether this assumption is accurate or not.
e. If this assumption is incorrect, please explain what you mean by "the purpose of the surface casing is to protect groundwater zones during the initial drilling and completion of the well".
f. If the surface casing is not meant to protect the well from groundwater contact/intrusion, what is used to protect the surface casing?
g. Please provide all regulations, best practices, industry standards that support the statement that "the purpose of the surface casing is to protect groundwater zones during the initial drilling and completion of the well".

<u>RESPONSE 1:</u>

a. See Special Report on Operations Witnessed, dated Nov. 17, 1953, at

AC_CPUC_0008666 and History of Oil or Gas Well, entry dated Nov. 17, 1953 at AC_CPUC_0008657.

b. N/A.

c. SoCalGas objects to this request to the extent it is argumentative in implying that DOGGR did not review and approve the oversight of the surface casing operations at the time the well was drilled. SoCalGas objects to this request as vague and ambiguous as to "never needs to check the field condition." SoCalGas further objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at p. 37. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. It is SoCalGas' position that SoCalGas complied with industry standards with respect to assessment of groundwater depths, which occurs at the time that surface casings are set.

d. SoCalGas objects to this request as compound. SoCalGas further objects to this request insofar as it assumes "protect groundwater zones" refers to protecting the casing against groundwater contact/intrusion. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No, the purpose of the surface casing is not limited to protect groundwater zones during initial drilling and completion of the well. The surface casing is not meant to protect groundwater zones throughout the life of the well. The purpose of the surface casing is not to protect the casing against groundwater contact/intrusion.

e. When drilling a well, the objective is not to shield the surface casing from contact with fresh-water aquifers (i.e., groundwater). The objective instead is to prevent contamination of the fresh-water aquifers from drilling fluids during the drilling of the well. Additionally, the surface casing provides no pressure barrier between the wellbore and the surrounding strata. The surface casing is not designed to contain gas within the wellbore. Therefore, after the initial drilling of the well, the integrity of the surface casing is a non-critical issue.

   For example, Blade notes that the "main function of surface casing is to isolate fresh water and provide structural support for the rest of the well, and not to provide a gas tight barrier to a production string." Blade Report at 86. Further,

the DOGGR regulations state only that a "[s]urface casing shall provide for control of formation fluids, for protection *of* shallow usable groundwater, and for adequate anchorage for blowout prevention equipment." Cal. Code Regs. §1935.2 (emphasis added).

f. SoCalGas objects to this request to the extent it is unintelligible. SoCalGas further objects to this request to the extent it is vague and ambiguous with respect to the phrase "protect the surface casing."

g. SoCalGas objects to this request as overly broad and unduly burdensome. SoCalGas further objects to this request to the extent it is vague and ambiguous with respect to the phrase "protect groundwater zones." SoCalGas further objects to this request to the extent that it seeks information that is publicly available and/or in the possession of SED. SoCalGas further objects to this request to the extent that this question assumes, consistent with question 1(d), that "protect groundwater zones" means "protect the casing against groundwater contact/intrusion." Subject to and without waiving the foregoing objections SoCalGas responds as follows. See Response 1(e).

QUESTION 2:

Please refer to pages 21 and 22, and the passage that states, "Based on the historical data in the Aliso Canyon field, there was no reason for SoCalGas to anticipate there might be a potential problem with corrosion of the production casing at a depth above the surface casing shoe inside the annulus between the production casing and the surface casing, as occurred in the SS-25 well. Blade investigated the occurrences of shallow corrosion throughout the field. Regarding the 27 wells they identified that demonstrated shallow corrosion, Blade determined that almost all of the wells had production casing external corrosion present below the surface casing shoe. Excluding the SS-25, only one well, P-50A, had production casing external corrosion above the surface casing shoe. [Footnote omitted.] Thus, corrosion on the production casing above the surface casing shoe was very rare. . .Knowledge of the hydrogeology and groundwater is only relevant for the design and implementation of the surface casing. [Footnote omitted]. With this in mind, please answer:

a. Applying the logic in this passage, it would appear that the SS-25 incident would be only the second well in the history of Aliso Canyon natural gas storage facility that had production casing external corrosion above the casing shoe. Is this accurate?
b. Assuming that the answer to question 2a is yes, does SoCalGas maintain that with only two wells in the history of Aliso Canyon natural gas storage facility that have had corrosion on the production casing above the surface casing shoe, that it remains irrelevant to know the hydrogeology and groundwater in the Aliso Canyon field for purposes other than design and implementation of the surface casing?
c. Is it also SoCalGas's position that knowledge of hydrogeology and groundwater is only relevant for the design and implementation of surface casing, even at lower depths below where the production casing ends?

RESPONSE 2:

a. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "SS-25 incident." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Blade concluded, at p. 189 of the Main Report, that of the wells Blade reviewed, there was only one well other than SS 25 with production casing external corrosion above the surface casing shoe.

b. SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the phrase "remains irrelevant." SoCalGas further objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at p. 22. SoCalGas' testimony on that page clearly relate to "groundwater depths relative to the surface casing shoe and production casing of the SS-25 well," not in the Aliso Canyon field as a whole.

c. SoCalGas objects to this request to the extent it is vague, ambiguous, and unintelligible, particularly with respect to the phrase "lower depths below where the production casing ends." SoCalGas further objects to this request to the extent that it mischaracterizes SoCalGas' position by stating "is it also SoCalGas's position." Subject to and without waiving the foregoing objection,

SoCalGas responds as follows. Please refer to SoCalGas' response to SED DR 71, Question 5(b). The surface casing is set at the appropriate depth relative to groundwater at the time the time the well is drilled.

QUESTION 3:

Please refer to the following passage on page 23: "Corrosion of the Surface Casing did not cause Corrosion in the Production Casing and the Surface Casing is not Intended as a Gas Barrier." (Emphasis in original.). With this passage in mind, please answer:

a. Identify where in Ms. Felts's testimony it takes the position that corrosion of surface casing caused the corrosion in the production casing. Include the page number and quote the passage.
b. Identify where in Ms. Felts's testimony it takes the position that the surface casing is intended as a gas barrier. Include the page number and quote the passage.
c. In your expert opinion, the surface casing is a barrier to groundwater contact/intrusion. Is it not?

RESPONSE 3:

a. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (However/Stinson) at p. 23. SoCalGas further objects to this request to the extent that the information is equally available to SED. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See SED's Opening Testimony at p. 25 ("SS-25's surface casing had the worst condition; logs showed multiple through-wall holes in the 11 ¾ in. casing from approximately 134 to 300 ft. The holes in the surface casing likely contributed to the 7-inch production casing corrosion and allowed ground water and oxygen to enter the 11 ¾ inch x seven-inch annulus.") Further, the implication of SED's Opening Testimony at pp. 45-47 is that SoCalGas did not have systemic practices to protect surface casing strings against external corrosion by failing to have, for example, cathodic protection on well SS-25. However, as stated by the Blade Report and in SED's Opening Testimony, cathodic protection would have provided corrosion protection to the 11 ¾ inch casing, but would not have

protected the 7 inch casing inside the 11 ¾ inch casing. See SED Opening Testimony at 45. If SED alleges that SoCalGas has violated Section 451 by failing to provide cathodic protection for well SS-25, the only implication here is that SED believes that the corrosion on the 11 ¾ inch surface casing caused the corrosion on the 7 inch production casing.

b. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at p. 23. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas has not stated that SED took the position that the surface casing is intended as a gas barrier.

c. SoCalGas objects to this request as argumentative to the extent that it implies that the purpose of the surface casing is to act as barrier to "groundwater contact/intrusion." SoCalGas further objects to this request as vague and ambiguous, particularly with respect to its request for an "expert opinion." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The surface casing acts as a barrier to groundwater contact during initial drilling of the well. When drilling a well, the objective is not to shield the surface casing from contact with fresh-water aquifers (i.e., groundwater). The objective instead is to prevent contamination of the fresh-water aquifers from drilling fluids during the drilling of the well. SoCalGas also notes the Blade Report at page 86: "[The] main function of surface casing is to isolate fresh water and provide structural support for the rest of the well, and not to provide a gas tight barrier to a production string." SoCalGas also notes Cal. Code Regs. §1935.2, which states that a "[s]urface casing shall provide for control of formation fluids, for protection *of* shallow usable groundwater, and for adequate anchorage for blowout prevention equipment" (emphasis added).

QUESTION 4:

Please refer to the following passage on pages 23 and 24, which states: "The Blade report also correctly points out that "[t]he function of the surface casing is to isolate fresh water sources and also provide a string for drilling the deeper hole for gas storage or oil production. The surface casing is not intended to provide any further barriers to gas or oil. [Footnote omitted.] "Thus, SoCalGas cannot be faulted for the condition of corrosion

on the surface casing and any escaping gas through holes in the surface casing, which were caused post-leak, [Footnote omitted.] because the purpose and objective of surface casing is not to provide a barrier to gas or oil leaving the wellbore."

a. Is it SoCalGas's position that the corrosion on surface casing of Well SS-25 cannot be an indicator of corrosion on the production casing?
b. If so, provide documentation that supports this position.
c. Is it SoCalGas's position that it need not have checked for corrosion on the surface casing of its other wells at Aliso Canyon natural gas storage facility?
d. Has SoCalGas checked for corrosion on the surface casing of its other wells at Aliso Canyon natural gas storage facility?
e. If the answer to question 4d is yes, provide the documentation showing that.
f. If the surface casing was not corroded, but gas was leaking from portions of the well bore surrounded by the surface casing, would the surface casing not act as a barrier to gas or oil leaving the wellbore making its way to the surface?

RESPONSE 4:

a. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at pp. 23-24. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No. The existence of corrosion on surface casing would not necessarily provide any indication of corrosion on production casing."

b. N/A.

c. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at p. 23-24. SoCalGas further objects to this request as vague and ambiguous, particularly with respect to the phases "checked for corrosion" and "other wells." SoCalGas further objects to this request as overly broad and unduly burdensome to the extent it does not specify a timeframe to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. It is SoCalGas' position that no regulation or industry standard required operators to evaluate surface casing of

gas storage wells for corrosion.

d. SoCalGas objects to this request to the extent that it is overly broad and unduly burdensome to the extent it does not specify a timeframe to which SoCalGas may tailor its response. SoCalGas further objects to this request as vague and ambiguous, particularly with respect to the phases "checked for corrosion" and "other wells." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request to ask whether casing inspection logs have been run on the surface casings of active gas storage wells at Aliso Canyon. No.

e. N/A.

f. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at pp. 23-24. SoCalGas further objects to this request to the extent that it presents an incomplete hypothetical. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Depending on the depth and severity of the leak in the production casing, the surface casing could temporarily prevent fluids from reaching the surface.

QUESTION 5:

Please refer to the Section entitled, "Cathodic Protection is not Industry Standard and Was Not Necessary for SS-25." On pages 25 through 27.

a. Note the passage in this section that states, "Cathodic protection can be an effective tool to prevent corrosion in shallow surface casing strings. While not an industry standard, the technology is used in some gas storage fields with known areas of high corrosion. Recall that, Aliso is not one of those areas: the Blade report documented finding no pattern of corrosion associated with well age, well location, or depth. Thus, given that the SS-25 well is not in a corrosion "hot spot," the operator must balance the limited benefits of using cathodic protection to shield the surface casing versus the potential limitations and downsides." With this in mind, please answer:

i. Notwithstanding well SS-25, is it SoCalGas's position that its wells in Aliso Canyon do not have corrosion?
ii. If the answer to question 5.a.i is yes, provide all the documentation showing that no corrosion exists on its Aliso Canyon wells.
iii. If the answer is no, please explain why.
iv. With regards to corrosion, is the term "hot spot" a term of art?
v. If yes, please provide all references (regulatory, internal) to corrosion hot spots.
vi. Include definitions to the term, "hot spot".
vii. Did SoCalGas ever attempt to determine if corrosion was an issue at the Aliso storage field?
viii. If so, please provide all instances where it did so.
ix. If not, please explain why SoCalGas did not study whether it had corrosion issues/hot spots at Aliso.

b. Note the passage in this section that states, "In areas of high well density, such as the three-well pad at the SS-25 location where wells are located within a few hundred feet of one another, the application of cathodic protection is complex and problematic. If the induced currents are not properly balanced, well casings that are not receiving adequate current will be unprotected and through oxidation reactions will actually see increased corrosion and casing leaks, above what would have occurred with no cathodic protection. In these situations, corrosion of surface casings is actually increased rather than prevented.

i. Is It SoCalGas's position that the cathodic protection at the "three-well pad at the SS-25 location" was not possible?
ii. If so, is it SoCalGas's position that the induced currents at the "three-well pad at the SS-25 location" could not be properly balanced prior to the incident at well SS-25?
iii. If the answer to either of these prior two questions is yes, provide all documentation that supports the "yes" position, including the page references and quoted passages that are in support.

iv. If the answer to question 5.b.ii is yes, did SoCalGas check to see whether the induced currents at the "three-well pad at the SS-25 location":
1. Were out of balance prior to the incident at well SS-25?
2. Could not be properly balanced prior to the incident at well SS-25?
3. If the answer to question 5.b.iv.1 is yes, provide all documentation, including page references and quoted passages, in support of the answer.
4. If the answer to question 5.b.iv.2 is yes, provide all documentation, including page references and quoted passages, in support of the answer.

v. Please identify by well name all of the wells in the Aliso Field that had or have Cathodic protection.
1. For each well listed, provide the date Cathodic protection was first installed.

vi. Has SoCalGas ever installed cathodic protection on any three-well pads at any of its gas storage fields?
1. If yes, please identify the field and the well names.
2. If yes, provide the documentation showing such installation.

vii. How many high well density clusters are there at the Aliso field?

viii. In your expert opinion should cathodic protection be used on any well at Aliso?

ix. If the answer is yes, which wells would benefit from cathodic protection and why?

x. If the answer to question 5.b.viii is no, please explain.

xi. Has SoCalGas completed any studies as to whether any of its wells at Aliso would benefit from cathodic protection?

xii. If yes, please provide all such analyses.

xiii. If the answer to question 5.b.xi is no, please explain why SoCalGas has not undertaken any cathodic protection studies.

c. Note the passage in this section that states, "Similarly, within the areal 'footprint' of a cathodic protection system, all wells must be protected. The Aliso Canyon field is not only a gas storage field, but there are non-storage operations within the field boundaries accessing shallower

hydrocarbon production. These shallow wells are not operated by SoCalGas. If SoCalGas were to install cathodic protection only on its gas storage wells, any shallow hydrocarbon wells operated by others at the field would suffer increased corrosion and loss of well integrity because of the cathodic protection currents."

With this passage in mind, please answer the following:

i. Is it SoCalGas's contention that the shallow wells referenced in this passage could not also be cathodically protected or receive other protections against the increased corrosion and loss of well integrity identified in this passage?
ii. Admit that SoCalGas did not communicate with the operators of these other shallow wells regarding comprehensive method to cathodically protect all wells at Aliso Canyon.
iii. If SoCalGas does not make the admission requested in response to question 5.c.ii, then provide documentation showing that SoCalGas communicated with these operators regarding a comprehensive method to cathodically protect all wells at Aliso Canyon.

d. Note the passage in the section that states, "Cathodic protection typically works very well on protecting surface pipelines or shallow gas gathering lines, where the resistivity of the environment around the steel is known and relatively uniform. However, in the case of vertical surface casing which extends to a depth of approximately 1,000 feet, such as the SS-25 well, the resistivity of the soils can change suddenly and dramatically with variations in depth. This results in an extremely difficult engineering solution to design a cathodic protection scheme that accounts for the rapid changes in soil resistivity and balances the current applied in the cathodic protection system. When multiple wells are added to the equation, such as would be the case around the SS-25 well pad, the problem becomes increasingly more difficult and complex. Any imbalance in the applied current will have the undesired effect of increasing corrosion."

    i. Prior to October 23, 2015, did SoCalGas attempt to design cathodic protection of the vertical surface casing of well SS-25?

ii. ii. If so, did SoCalGas determine that the "extremely difficult solution to design a cathodic protection scheme" made infeasible the design and construction of cathodic protection of the vertical surface casing of well SS-25?
iii. iii. If the answer to question 5.d.i is yes, provide the documentation showing this, including page references and supporting quoted language.
iv. iv. If the answer to question 5.d.ii is yes, provide the documentation showing this, including page references and supporting quoted language.

e. Note the passage in the section that states, Finally, the axial rupture of the production casing occurred at a depth of 892 feet, which was inside the surface casing of the well. The Blade report clearly states, "While a cathodic protection system would have provided corrosion protection to the 11 ¾ in. casing, it would not have protected the 7 in. casing inside the 11 ¾ in. casing." [Footnote omitted.] Thus, an independent corrosion protection mechanism like cathodic protection would not have been useful in this case, contrary to the suggestions made in the SED testimony. With this passage in mind, please answer:
   i. Prior to October 23, 2015, did SoCalGas attempt to design cathodic protection of the 7 inch casing that was below the 11 ¾ inch casing?
   ii. If so, did SoCalGas find it infeasible to install cathodic protection on the 7 inch casing below the 11 ¾ inch casing?
   iii. If the answer to question 5.e.i is yes, provide documentation showing this, including references to page numbers and quotes of passages.
   iv. If the answer to question 5.e.ii is yes, provide documentation showing this, including references to page numbers and quotes of passages.
   v. Is it SoCalGas's position that cathodic protection would not have provided corrosion protection of the 7 inch casing below the 11 ¾ inch casing if it had been installed along that portion of the 7 inch casing?
   vi. If so, provide documentation that supports that position.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-75 DATED APRIL 13, 2020

SOCALGAS RESPONSE DATED MAY 5, 2020

RESPONSE 5:

a.

i. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at pp. 23-24. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

ii. N/A.

iii. SoCalGas objects to this request as vague, ambiguous and unintelligible. SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent it does not specify a timeframe to which SoCalGas may tailor its response.

iv. SoCalGas objects to this request that it is vague and ambiguous, particularly with respect to the phrase "term of art."

v. N/A.

vi. SoCalGas objects to this request as vague, ambiguous and unintelligible. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas understands this question to be asking for the definition of "hot spot" as a "term of art." Please refer to SoCalGas' answer to 5(a)(iv) above.

vii. SoCalGas objects to this request to the extent that it is vague and ambiguous, particularly with respect to the terms "attempt" and "issue." SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent it does not specify a timeframe to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas was aware of the general potential for corrosion in gas operations.

viii. See, e.g., GRC Testimony of Philip Baker, 2014, at page PEB-19, noting that "Ultrasonic surveys conducted in storage wells as part of well repair work from 2008 to 2013 identified internal/external casing corrosion, or mechanical damage in 15 wells." The purpose of these surveys was to check for external corrosion, as further stated in Mr. Baker's testimony.

ix. N/A.

b.

i. SoCalGas objects to this request as vague and ambiguous, particularly

with respect to the phrase "not possible." SoCalGas further objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at p. 26. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. While cathodic protection could have been applied to the "three-well pad at the SS-25 location" it may have increased, rather than decreased, the risk of corrosion on one or more wells.

ii. See SoCalGas' Response to 5.b.i.

iii. N/A.

iv. N/A.

1. N/A.
2. N/A.
3. N/A.
4. N/A.

v. SoCalGas objects to this request on the ground it does not specify any particular timeframe to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Subject to and without waiving the foregoing objections, SoCalGas responds as follows: Cathodic Protection is applied to well casings at the following locations at the Aliso Canyon facility: Porter 50B, Porter 50C, FF33, FF34A, and FF34BR.

1. Cathodic protection systems were applied to the referenced Porter and Fernando Fee wells on or around 2015 and 1992, respectively.

vi. SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling Dated September 26, 2019. SoCalGas further objects to this request on the ground it does not specify any particular timeframe to which SoCalGas may tailor its response. Moreover, SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "installed cathodic protection on any three-well pads". Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request to ask whether cathodic protection was installed downhole on well pads with three or more wells at Aliso Canyon. No.

1. N/A.

2. N/A.

vii. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "high well density clusters." SoCalGas further objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at p.26.

viii. SoCalGas objects to this request as vague and ambiguous, particularly with respect to its request for an "expert opinion." SoCalGas further objects to this request to the extent it is vague and unintelligible, particularly with respect to the phrase "any well." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas applies cathodic protection to its wells when prudent to do so. For a list of wells that SoCalGas has applied cathodic protection, please see SoCalGas' Response to Question 5.b.v.

ix. N/A.

x. N/A.

xi. SoCalGas objects to this request to the extent that it is vague and ambiguous, particularly with respect to the phrase "any studies" and the term "benefit." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this question to ask whether SoCalGas completed any formal written studies as to whether SoCalGas should apply cathodic protection downhole on gas storage wells at Aliso Canyon. The determination of whether to apply cathodic protection to a well casing is made on a case-by-case basis. Factors considered include, but are not limited to: whether the individual well, the region near the well, and the field as a whole exhibit a known history of external corrosion; whether cathodic protection is feasible in light of geologic and other conditions at the field; whether those same conditions would make cathodic protection effective at mitigating external corrosion; and whether interference effects from the cathodic protection anode would cause or exacerbate external corrosion on nearby structures.

SoCalGas is continuing to evaluate the feasibility of cathodic protection to well casings at the Aliso Canyon Storage Field. However, certain characteristics of the field suggest that cathodic protection cannot be widely implemented without exacerbating external corrosion on metal structures (including assets that are not owned or operated by SoCalGas)

due to interference effects. Please see previously provided documents with Bates range: AC_CPUC_0022178, AC_CPUC_0022179, AC_CPUC_0022709, and AC_CPUC_SED_DR_17_0000673. Please also see the enclosed electronic documents with Bates number I1906016_SCG_SED_DR_75_0000001 - I1906016_SCG_SED_DR_75_0000011.

xii. See Response 5bxi.

xiii. See Response 5bxi.

c.

i. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at pp. 26-27. SoCalGas further objects to this request as compound, and vague and ambiguous, particularly with respect the phrase "or receive other protections against the increased corrosion." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

ii. SoCalGas objects to this request to the extent it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson) at pp. 26-27. SoCalGas also objects to this request as overly broad and unduly burdensome to the extent it does not specify a timeframe to which SoCalGas may tailor its response. SoCalGas further objects to this request to the extent it is argumentative in implying that a comprehensive method to cathodically protect the wells at Aliso Canyon was possible. Moreover, SoCalGas objects to this request as vague and ambiguous particularly with respect to the phrase "comprehensive method."

iii. See Response 5cii.

d.

i. SoCalGas objects to this request as vague and ambiguous particularly with respect to the phrase "attempt to design cathodic protection." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Cathodic protection was not applied to the surface casing of Well SS-25.

ii. N/A.

iii. N/A.

iv. N/A.

e.

i. SoCalGas objects to this request as vague and ambiguous particularly with respect to the phrase "attempt to design cathodic protection." SoCalGas further objects to this request to the extent it seeks information that is not relevant. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Cathodic protection was not applied to the 7" production casing of Well SS-25. No.

ii. N/A.

iii. N/A.

iv. N/A.

v. SoCalGas objects to this request to the extent that it mischaracterizes or misunderstands SoCalGas' Prepared Reply Testimony, Chapter I (However/Stinson) at p. 27 and the Blade Report at p. 215. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. No.

vi. Pursuant to the Blade Report, "a cathodic protection system . . . . would not have protected the 7 in. casing inside the 11 ¾ in. casing." Blade Report at 215. Additionally, SoCalGas notes that the Blade Report solutions do not include providing cathodic protection to protection casings. (Blade Report at 233.)

QUESTION 6:

Please identify which portions of the witness qualifications of Mr. Stinson qualify him to provide the portion of testimony that relates to corrosion.

RESPONSE 6:

SoCalGas objects to this request as unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, as the "burden, expense, or intrusiveness of [this request] clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence. SoCalGas further objects to this request to the extent it is argumentative in implying that Mr. Stinson is not qualified to provide testimony related to corrosion in natural gas storage fields. Subject to and

without waiving the foregoing objections, SoCalGas responds as follows. Mr. Stinson's qualifications relating to gas industry standard practices, as described in SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), pp. 44-45 and SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-74, qualify him to provide the portion of testimony that relates to corrosion.

QUESTION 7:

Please identify which portions of the witness qualifications of Mr. Stinson qualify him to provide the portion of testimony that relates to cathodic protection.

RESPONSE 7:

SoCalGas objects to this request as unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, as the "burden, expense, or intrusiveness of [this request] clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence. SoCalGas further objects to this request to the extent it is argumentative in implying that Mr. Stinson is not qualified to provide testimony related to cathodic protection in natural gas storage fields. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Mr. Stinson's qualifications relating to gas industry standard practices, as described in SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), pp. 44-45 and SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-74, qualify him to provide the portion of testimony that relates to cathodic protection.

QUESTION 8:

Please identify which portions of the witness qualifications of Mr. Hower qualify him to provide the portion of testimony that relates to corrosion.

RESPONSE 8:

SoCalGas objects to this request as unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, as the "burden, expense, or intrusiveness of [this request] clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence. Subject to and without waiving

the foregoing objections, SoCalGas responds as follows. Mr. Hower's qualifications relating to gas industry standard practices, as described in SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), pp. 42-43 and SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-73, qualify him to provide the portion of testimony that relates to corrosion.

QUESTION 9:

Please identify which portions of the witness qualifications of Mr. Hower qualify him to provide the portion of testimony that relates to cathodic protection.

RESPONSE 9:

SoCalGas objects to this request as unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, as the "burden, expense, or intrusiveness of [this request] clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Mr. Hower's qualifications relating to gas industry standard practices, as described in SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), pp. 42-43 and SoCalGas' Prepared Reply Testimony, Chapter I (Hower/Stinson), Ex. I-73, qualify him to provide the portion of testimony that relates to cathodic protection.

QUESTION 10:

Provide all documentation in support of the answers to questions 6 through 9.

RESPONSE 10:

N/A.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-77 DATED APRIL 15, 2020

SOCALGAS RESPONSE DATED APRIL 27, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 15, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

Please refer to the following passage on page 41. "SED's testimony, provided by Ms. Margaret Felts, indicates that she never reviewed the actual physical Aliso Canyon well files. [Footnote omitted.] Ms. Felts acknowledges that she only reviewed an electronic production of records from SoCalGas' well files in response to a data request, not a physical well file. [Footnote omitted.] Therefore, we believe that without properly reviewing the actual well files, SED cannot appreciate the accuracy or completeness of the SoCalGas well files at Aliso Canyon."

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DETECTION OF EXTERNAL PIPE DEFECTS WITH A MODIFIED BOREHOLE TELEVIEWER

by K. W. Katahara, D. G. Kyle, R. W. Siegfried, M. F. Gard,
W. P. Goodwill, T. Schasteen, and S. G. Petermann
ARCO OIL & GAS COMPANY

Abstract

The conventional ultrasonic televiewer is capable of precise and detailed mapping of the topography of the borehole wall or of the inner surface of casing and production tubing. ARCO has recently designed, built and tested a new televiewer that is also capable of determining pipe wall thickness with the same detail. The major functional modifications in ARCO's tool relative to the previous televiewer are (1) that the ultrasonic transducer is exposed directly to the borehole fluid without an intervening window; and (2) that the ultrasonic signal is digitized downhole for later transmission up the wireline. A microprocessor in the tool controls the measurement process and can perform significant portions of the signal processing downhole. Although the system was designed to do real-time calculations, the data are currently recorded at the surface and are subsequently processed to obtain thicknesses. A lateral resolution of 1/4" and a wall thickness accuracy of 0.01" are possible. The minimum resolvable wall thickness depends on the ultrasonic bandwidth and is about 0.1" for the transducers used to date. The prototype tool has been tested in pipe with well-characterized external defects, and some examples of test results are shown. The thickness data are displayed as pseudo-color images or as cross-sections or polar plots. The areal extent of defects can be mapped out with precision, but quantitative thickness data can be obtained only where the inner and outer pipe surfaces and the ultrasonic wavefronts are approximately parallel. Fortunately this normally includes wall thickness minima. Although the initial goal was to detect exterior corrosion on pipe, other applications such as cement bond logging are possible.

Introduction

A number of logging tools are in use for detecting corrosion or wear on the inner surface of casing or tubing. The borehole televiewer (BHTV) is notable among these for having very dense coverage of the inner pipe surface together with good resolution of the depth of defects. As discussed in a later section, currently available tools which detect defects on the outer surface of the pipe tend to lack resolution, be unreliable, or have incomplete coverage of the surface. Because of a need for accurately characterizing external casing defects, ARCO has carried out extensive modifications to the BHTV to enable it to determine the pipe wall thickness with the same resolution and coverage that it gives in conventional applications. This paper describes the resulting prototype "digital ultrasonic scanning tool" (DUST), and some early test results.

The ultrasonic borehole televiewer (BHTV) was first developed at Mobil (Zemanek et al., 1969) to image the borehole wall. Improvements in the recording and display systems, and the introduction of image processing techniques and travel-time (caliper) measurement capability (Wiley, 1980;

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Broding, 1981; Pasternack and Goodwill, 1983; Taylor, 1983) enhanced the utility of the BHTV, and it has since been widely used.

The BHTV uses a piezoelectric transducer to send an ultrasonic pulse out from the tool as shown in Figure 1. Returning echoes are received by the same transducer. Electronic circuits measure the amplitude and travel-time of the echo from the inner surface of the tubing or casing. The transducer rotates at three revolutions/second and is pulsed about 500 times per revolution as the tool moves uphole. The ultrasonic spot size is usually large enough to provide complete coverage of the casing surface at a logging speed of 5'/minute. Corrosion on the inner surface shows up as an increase in echo travel-time and a decrease in echo amplitude, and detailed images of the depth and lateral extent of damage can be produced (e.g., see Zemanek, 1969; Broding, 1984; Pasternack and Goodwill, 1983; and Rambow, 1984).

Our design goals were to modify the BHTV to measure casing thicknesses in the range of 0.06" to 0.6" with an accuracy of 0.01" (.25 mm). We wanted a versatile tool that would also have conventional BHTV capabilities in both cased and open hole applications. We wanted a reliable tool that would produce high-resolution images, preferably in real-time. For our purposes, "real-time" means that the thickness at each point must be measured in about a millisecond or less. Major problems were optimizing the ultrasonic signals, handling the tremendous amount of generated data, and coping with the limited bandwidth of the wireline. These problems required such extensive modifications to the BHTV that the result is essentially a new tool. It will become clear in the following discussion that although the Digital Ultrasonic Scanning Tool (DUST) does not meet all of our design goals, it comes close in many respects.

Tool Description

The DUST is shown in Figure 2. It is a 3.25" diameter tool that has so far been tested as a whole to 300 F and 8000 psi. Portions of the electronics have been qualified from -67 to 347 F and testing of the complete tool in adverse environmental conditions will continue. The major mechanical difference from the BHTV is that the ultrasonic transducer is mounted on a rotating head at the bottom of the DUST exposed to the borehole fluid. We became aware shortly after starting this project that ultrasonic reverberations due to the BHTV acoustic window, which separates the rotating transducer from the mud (Zemanek, 1969), were causing the ultrasonic pulse to be undesirably complicated for thickness measurements. We therefore eliminated the window and placed the transducer in contact with the mud. The transducer head is at the bottom of the tool to reduce the number of rotating seals and the associated drag. We have a small but growing collection of piezoelectric transducers, each mounted in its own head with impedance matching circuitry included.

In choosing transducers, there is a tradeoff between good thickness resolution and the need to inspect rough pipe surfaces in thick muds. Given a limited amount of signal processing time, good thickness resolution requires broad frequency bandwidth, but higher frequency ultrasound is attenuated greatly by muds and by reflection from rough casing surfaces. We need to use as low a frequency as possible consistent with our goal of resolving thin pipe walls. Our tests to date have employed fairly broadband transducers with usable energy

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between about 1 and 2.7 MHz, which gives a minimum resolvable wall thickness of about 0.1" with our current thickness determination method. If faced with heavy muds, we can give up some resolution and use lower frequency transducers.

Figure 3 shows a simplified functional diagram of some parts of the DUST electronics. The heart of the system is a Texas Instruments TMS320C25 digital signal processor (DSP). The DSP is a very fast chip which performs control and communications functions in addition to signal processing. It provides a great deal of flexibility in that many DUST functions can be modified either through a digital downlink from the surface, or by reprogramming the erasable-programmable-read-only-memory (EPROM) in the tool.

To begin with, the transducer is driven by an arbitrary waveform sent to the DSP from the surface. This is often a simple spike pulse, but it could be a complex waveform chosen to optimize the received echoes. For instance, if the impulse response of the the transducer is measured, then an inverse filter could be used as the transducer excitation in order to obtain echoes which are highly compressed in time (Schafer and Lewin, 1984).

The DSP also controls blanking and gain of the receiver circuits. The receiver gain is variable over a 37 dBV range. Since the driving waveform amplitude is also adjustable, the effective gain range of the system is much higher. The filtered and amplified echoes are digitized by an 8-bit flash A/D (analog to digital) converter which sends the data to the DSP for processing. Ultimately, we hope that the DSP will perform thickness computations downhole and send only the results, or a greatly compressed data set, to the surface. We believe this to be possible with some care in choosing and coding the algorithm. However, at least during the testing phase, we wish to examine the raw ultrasonic data. Thus we need to get large amounts of data (on the order of a Megabit/sec) up the wireline, which may have a bandwidth of only a few tens of kHz.

We do this by only transmitting the parts of the waveform that contain essential information. Currently, we digitize 32 samples from the initial inner surface echo at 67 ns intervals, and 128 samples from the casing resonance sequence (Figure 4) at 100 ns intervals. Thus we need to send about 160 bytes up the wireline in addition to timing and other information. This is done by clocking the data out with a D/A (digital to analog) converter at a rate slow enough that the stretched analog signal survives transmission up the wireline. Depending on the length of the wireline, it may be necessary to reduce the transducer pulse rate to allow more time for stretching the signal. For instance, we can operate at a pulse rate of about 200 per rotation (600 pulses/second) for a 20 kft wireline. This still allows full coverage for most pipe sizes.

The pulse rate and the cable-driving D/A rate can be set from the surface. We can also vary, either in software or firmware, the digitizing rate, the trigger level for data acquisition, the number and position of the samples, and other parameters. Various quality control functions are also performed by the DSP on command from the surface.

At the surface the stretched ultrasonic signal is written to tape in analog form for later digitization and processing. An IBM AT-compatible computer is used to

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control communications with the DSP downhole, and eventually will be used for on-site processing, recording, and display when the real-time casing thickness computation is implemented.

Thickness Calculation and Display

Several methods of calculating thickness from the ultrasonic signal have been considered. The one described here is reliable and straightforward, though slow in execution. The received signal consists of an large initial echo from the inner casing wall followed by a series of much smaller casing reverberation echoes (Figure 4), which are opposite in phase to the first echo. Thicknesses are obtained by measuring the periodicity of the casing reverberations. We digitize a portion of the signal coming after the initial echo has died off. The data is tapered and Fourier transformed, and the resulting power or amplitude spectrum is autocorrelated (Figure 5). If there are two or more casing harmonics in the spectrum, there will be a strong peak in the autocorrelation at a lag equal to the fundamental resonance frequency of the casing,

$$F = V/2L$$

where V is the velocity of sound in steel (6 mm/us) and L is the casing wall thickness. We use a quadratic interpolation scheme to pick the peak position, F. Autocorrelation of the spectrum has some drawbacks, but it avoids ambiguities in identifying harmonics. From the standpoint of processing speed, it is perhaps worth noting that the autocorrelation of the spectrum contains much the same information as the spectrum of the squared time signal.

We also define a rough measure of confidence in the thickness determination (see Figure 5):

$$C = AB$$

where B is the normalized height of the first autocorrelation peak, and A is the depth of the valley at the midpoint between the peak and the origin. In other words C is the product of B, a measure of the energy in the casing resonance, and A, a measure of the contrast between the resonance peak and the background noise. Figures 6 and 7 show examples of high and low confidence level signals respectively. In practice we can usefully distinguish four discrete confidence levels (stored digitally as a two bit integer).

We have also tried various ways of displaying the thickness data. Probably the most effective is a pseudo-color image in which the thickness is indicated by the hue, and the confidence by the saturation or brightness. Here we will show gray-scale images with thickness indicated by brightness. At any given depth it is also possible to plot a cross-section or a polar plot of wall thickness.

Test Results

The prototype DUST was completed in 1987. It has been tested to high pressure, high temperature, and over long wirelines. Its thickness measurement capability has been tested in pipe with artificial defects as well as in naturally corroded pipe. The data discussed below is from a test in which the prototype tool

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was run in 5.5" O.D. by 4.6" I.D. pipe with an exterior machined flat and an exterior circumferential flat-bottomed groove.

These figures contain some artifacts which need explanation. At the time this data was processed, our digitization system required that the analog recorded data be digitized in eight passes, each covering a 45 degree section of the pipe. Furthermore, data was digitized usually from every other rotation, except that two rotations were occasionally skipped in an unpredictable pattern. Thus the different passes start at slightly different points and have slightly different vertical sampling rates. (A new digitization system has been completed but there has not been time yet to reprocess the data.)

Figure 8 is a polar plot of wall thickness in a region without defects. The confidence level for the thickness determination is indicated by the symbol size, the largest symbols being most reliable. The "true" average thickness (0.362") as measured with a high resolution ultrasonic thickness gauge is in good agreement with the DUST thicknesses.

Figure 9 is a polar plot of data at the circumferential groove. The data from NW to NE are from within the groove area. (The north, south, east and west directions are shown only for reference). Elsewhere, the thicknesses are generally indicative of the area outside the groove. The thicknesses at and outside the groove are again in good agreement with the true thicknesses.

Figure 10 is a polar plot of data at the machined external flat. The cluster of points at about 0.27" wall thickness at the NW is from the center of the flat. The points in the cluster individually have a low confidence level, but are more credible taken as a group. Furthermore, similar clusters are seen in rotations above and below, so the vertical continuity makes the thickness measurement more credible. Thickness measurements are not obtained from the flat except at its center because the ultrasound is reflected at too large an angle to return to the transducer.

Figure 11 is a gray-scale image of about 5 feet of the pipe joint described above. Black indicates that valid thickness measurements were not obtained. Valid thickness values are shown such that thinner areas are white and casing of normal thickness is gray. The dark stripe at upper right is the external flat, and the white stripe through its center is the data from the center of the flat. There is a thin line near the bottom of the image which is produced by the circumferential groove. This image illustrates the televiewer-like areal resolution of the DUST. The circumferential groove is 0.5" wide. The DUST sees the groove and determines accurate wall thickness values over much of the groove circumference. Likewise the external flat is well-defined areally, though wall thicknesses are determined only at the center of the flat. This is a general feature of DUST thickness images. We can see the lateral extent of defects very well, but accurate thicknesses are obtained only where the inner and outer pipe surfaces are roughly parallel to each other and to the transducer face. Fortunately this usually includes areas where the wall thickness is a minimum.

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Comparison with Other Casing Inspection Tools

Several tools are used to detect downhole corrosion. Caliper tools have fair azimuthal resolution, but of course are completely insensitive to corrosion on the outer surface of casing. ARCO has recently built an improved tool for measuring galvanic potential, thereby identifying corroding intervals. This tool and others like it are more suitable for identifying problem areas than for detailed inspection.

Flux leakage and eddy current tools can be sensitive to the intrinsic casing magnetic and electrical properties. Since these properties can vary significantly from point to point on uncorroded casing, these techniques can give false indications. These tools have relatively poor resolution because they measure casing properties averaged over areas a few inches across or larger.

The Schlumberger Cement Evaluation Tool (CET) and the Gearhart Pulse Echo Tool (PET) are closest to our "digital ultrasonic scanning tool" in capability. These are ultrasonic tools with eight transducers arranged 45 degrees apart around the circumference of the tool. The CET was originally designed to detect cement bond problems, but has been adapted to give casing thickness measurements (Dumont et al., 1984). The PET performs similar functions (Sheives et al, 1986). Both the CET and the PET determine thickness by exciting the fundamental casing resonance, while the DUST relies more on harmonics. The CET apparently uses a frequency domain method to determine the resonance frequency (Dumont et al., 1984; Havira, 1981), whereas the PET uses a fast time-domain processing algorithm (Sheives et al, 1986). The primary differences between the DUST and the CET or the PET are related to resolution.

The CET/PET transducers usually illuminate only a fraction of the total casing surface. Thus there is a good possibility of missing serious problems. The DUST will usually cover the entire surface and therefore has a much better chance of catching defects. The DUST provides a much more detailed image of the areal extent of defects. The tradeoff of course is that the DUST must be logged more slowly -- 5 ft/min is a good speed.

The precision of thickness measurements among the three tools is probably comparable. The minimum wall thickness measurable by the CET and the PET is about 0.2". The DUST with its higher frequency transducers can obtain thicknesses down to 0.1", and even lower with some modifications. The tradeoff here is that a smaller minimum wall thickness either reduces the ability to cope with attenuative muds and rough surfaces, or it requires much more signal processing time. The DUST is versatile enough to operate over a range of transducer frequencies, including those used in the CET and PET.

We have found that having the DUST confidence level for each thickness is a valuable interpretational aid which is worth the extra computational effort. Neither the CET or the PET has a similar feature to our knowledge.

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Summary and Conclusions

The ARCO "digital ultrasonic scanning tool", DUST, has been built specifically for detailed imaging of exterior corrosion of casing and tubing. The DUST employs a windowless rotating transducer and state-of-the-art electronic circuitry to produce, acquire and record ultrasonic echoes from casing. Digital signal processing techniques are used to extract wall thickness values. The thickness data and associated confidence values are displayed as gray-scale or pseudo-color images, or in polar plots.

The DUST offers better resolution than existing corrosion detection tools. Because it is slow running, it is probably best used for detailed inspection in areas that a faster survey tool has identified as having problems.

The DUST is highly versatile. It performs all the functions of the conventional BHTV. It can also be used for cement bond inspection in the same way as the CET and PET, given changes in transducers, and in software and firmware. It should be capable of very detailed televiewer-like imaging of cement-bond quality. With other modifications the DUST can be used in open-hole applications as well.

Acknowledgments

L. J. Smith helped greatly in both the design and testing of the tool. Y. Ohashi provided essential help with processing and display. Others who made important contributions to the tool development include E. Pasternack, E. Howell, D. Lafferty, J. Watson, L. Sauer, L. Patterson, W. Hetherington, S. Seale, K. Riggs, D. Wood, K. Whitlock, D. Hearn, and M. Batzle.

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Biographical Sketches

Keith W. Katahara is a Senior Research Geophysicist at ARCO Oil and Gas Company. He has a B.S. (Physics, 1969) and Ph.D. (Geophysics, 1977) from the University of Hawaii, and an M.A. (Physics, 1970) from the State University of New York at Stony Brook. He did laboratory ultrasonic and acoustic research at the Hawaii Institute of Geophysics before joining ARCO in 1983.

Donald G. Kyle is a Senior Research Engineer in the Research and Technical Services Department of ARCO Oil and Gas Company. He obtained a B.S.E.E (1974) and an M.S.E.E. (1976) at Texas Tech University. He worked for Halliburton Services from 1977 to 1983. He has been involved with logging technology at ARCO since 1983.

Robert W. Siegfried, II has degrees from California Institute of Technology (B.S., Physics, 1972) and Massachusetts Institute of Technology (Ph.D., Geophysics, 1977). From 1977 to 1980 he worked on optical waveguide fabrication techniques at Corning Glass works. Since 1980 he has worked on various acoustic and ultrasonic logging technologies at ARCO Oil and Gas Company where he is now a Principal Research Geophysicist.

Michael F. Gard, B.S.E.E. Kansas State University (1971), M.S.E.E. Washington University (St. Louis, 1972), presently doing time as Ph.D.E.E. candidate at Southern Methodist University. Currently Sr. Research Engineer with ARCO Oil and Gas Company's Research Center in Plano, Texas. Previously employed by Beech Aircraft Corp., St. Louis VA Medical Center, Storz/SMR, and

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AMOCO Exploration Company. Senior member of IEEE; Active member of SEG. Primary interests are his wife and two daughters.

William P. Goodwill is a Principal Research Engineer in the Research and Technical Services Department of ARCO Oil and Gas Company. He received an A.S.E.T. degree (1966) from Oklahoma State University, a B.S.E.E. degree (1971) from the University of New Mexico, and a M.S.E.E. degree (1982) from Southern Methodist University. He has been employed by Los Alamos National Laboratory and by Texas Instruments. He has been employed by ARCO Oil and Gas Company since 1981.

Thomas Schasteen is a Senior Mechanical Engineer in the Mechanical Design Group. He has been employed by ARCO Oil and Gas Co. since 1985. He graduated from the University of Missouri at Rolla in 1980 with a B.S. in Petroleum Engineering. Previous Employment includes Halliburton Services, Core Laboratories and LTV Energy Products.

Steven G. Petermann is the Supervisor of the Mechanical Design and Shop Services Group of ARCO Oil and Gas Co. He received a B.S.M.E. from Texas Tech University in 1971. He previously worked for Texas Instruments and has been with ARCO since 1981.

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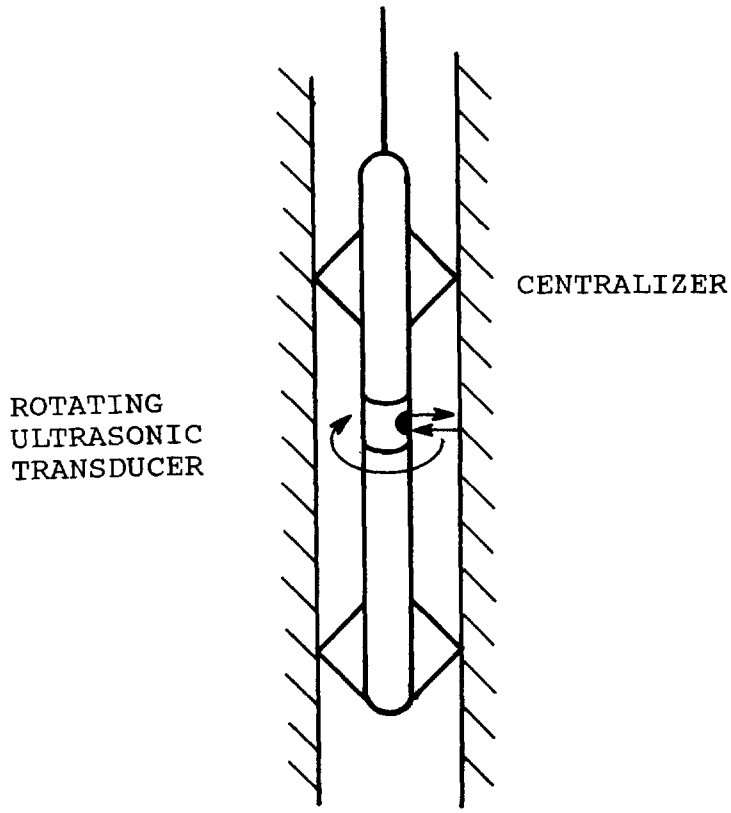

Figure 1. Borehole televiewer operational schematic.

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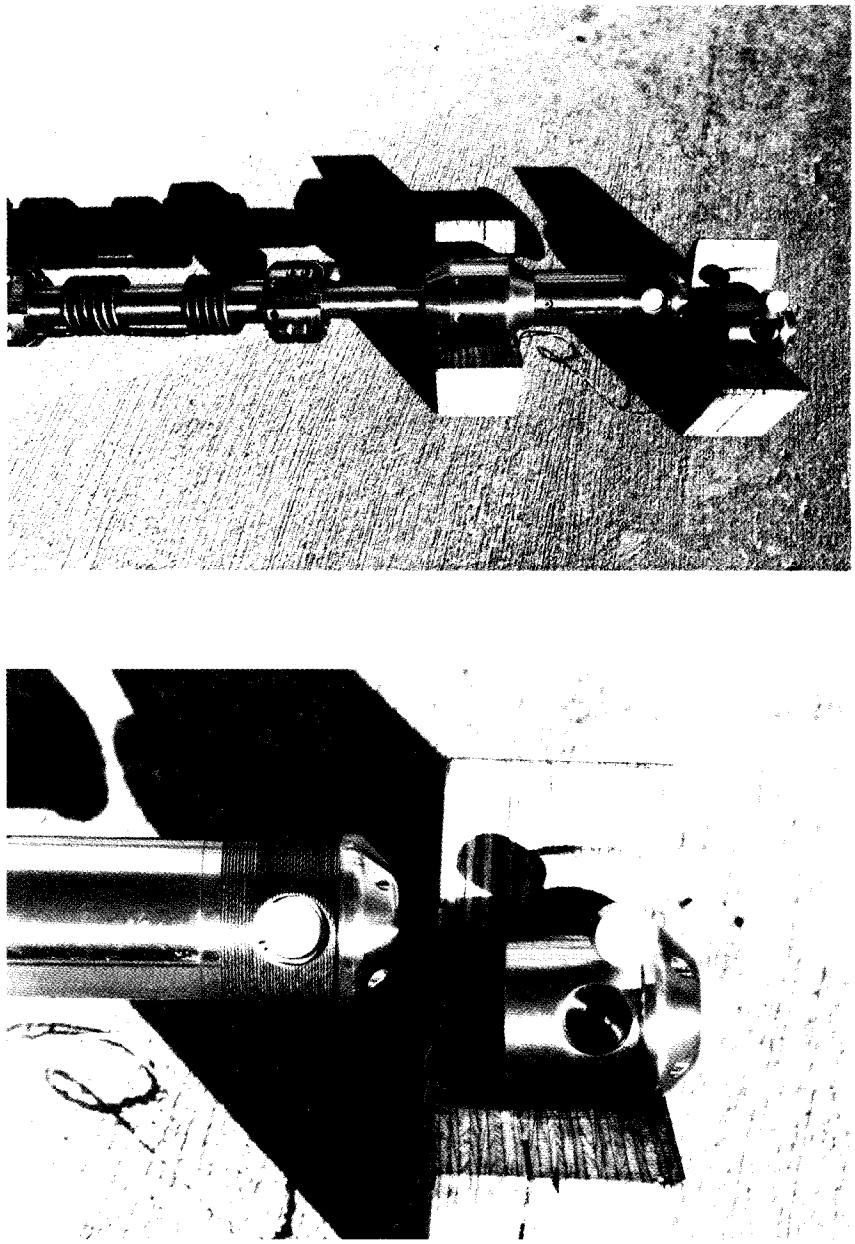

Figure 2. ARCO's Digital Ultrasonic Scanning Tool (DUST). The lowest two feet of the tool is shown at the top. The bottom centralizer with its roller arms removed is to the left. The rotating head is at the very end of the tool. A spare head with its transducer perched above it is shown to the right of the tool. A close up of the heads is at the bottom. The transducers are 0.75" in diameter.

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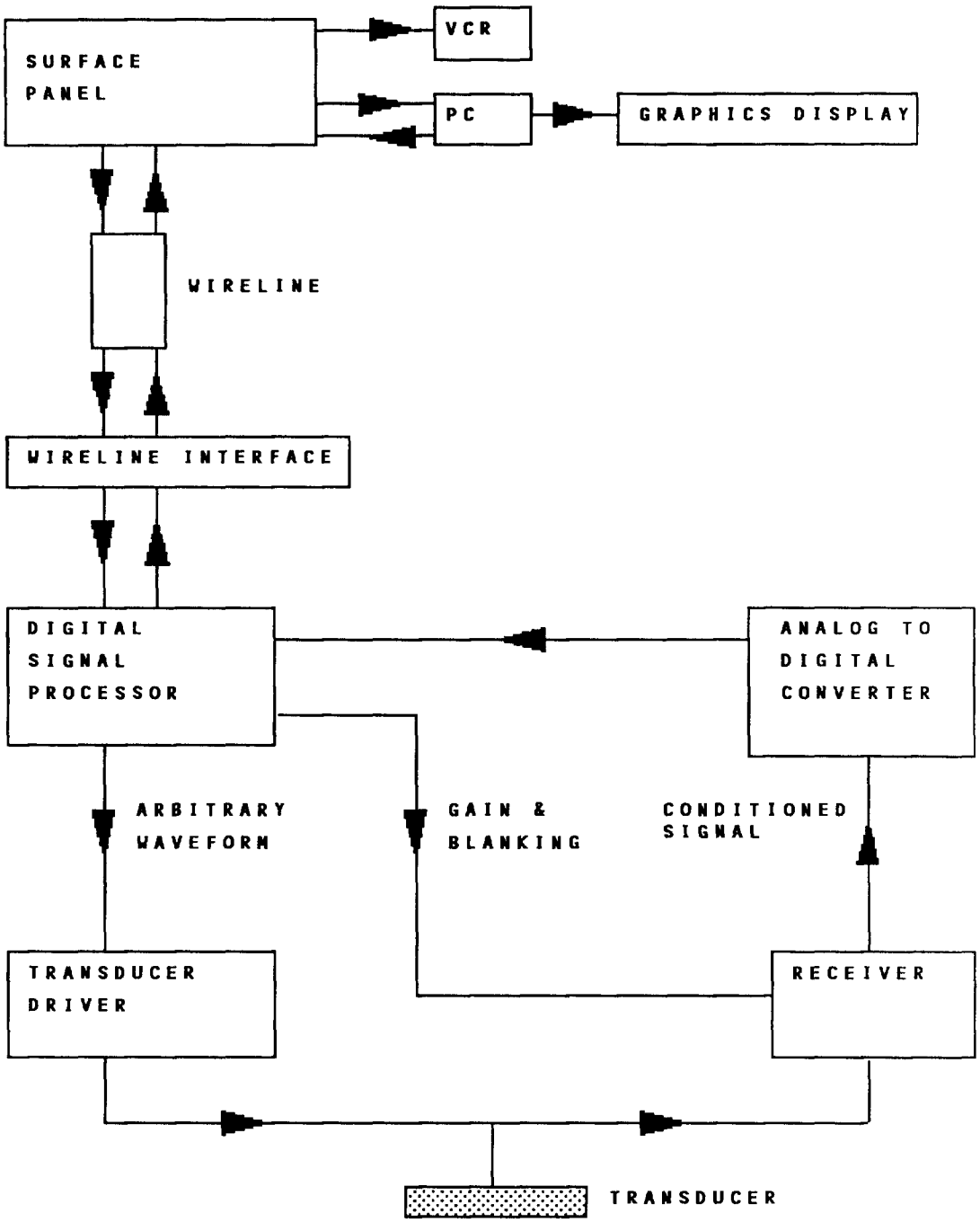

Figure 3. Schematic functional diagram of DUST electronics.

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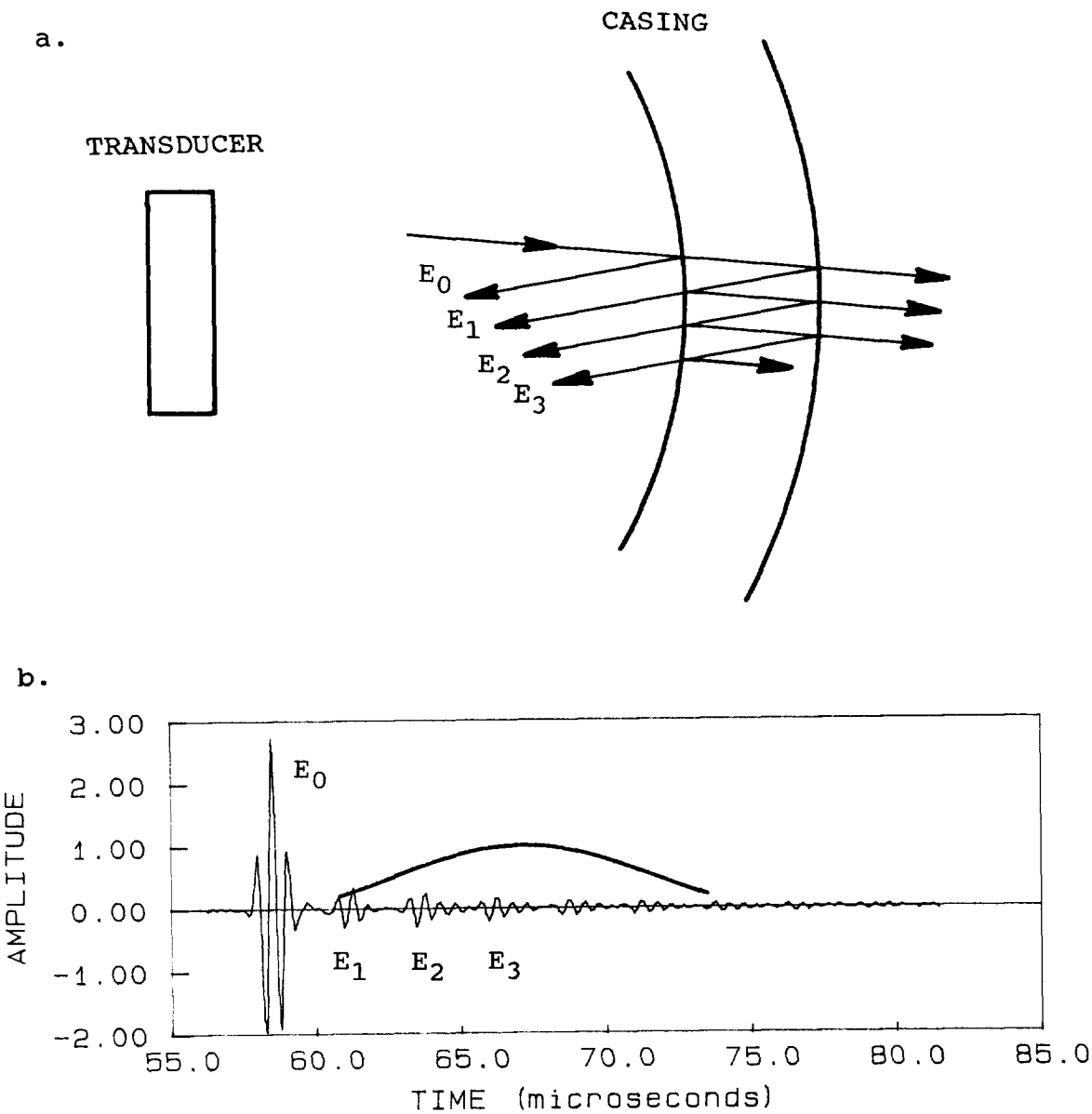

Figure 4. a. Ray diagram for ultrasonic echoes from casing. b. Actual experimental echo sequence from uncorroded pipe. The initial echo, E_0, and a portion of the reverberatory sequence, E_1, E_2, E_3,... are digitized and sent uphole. The heavy smooth curve above the trace indicates the part of the signal used for the thickness calculation, and the shape of the applied taper.

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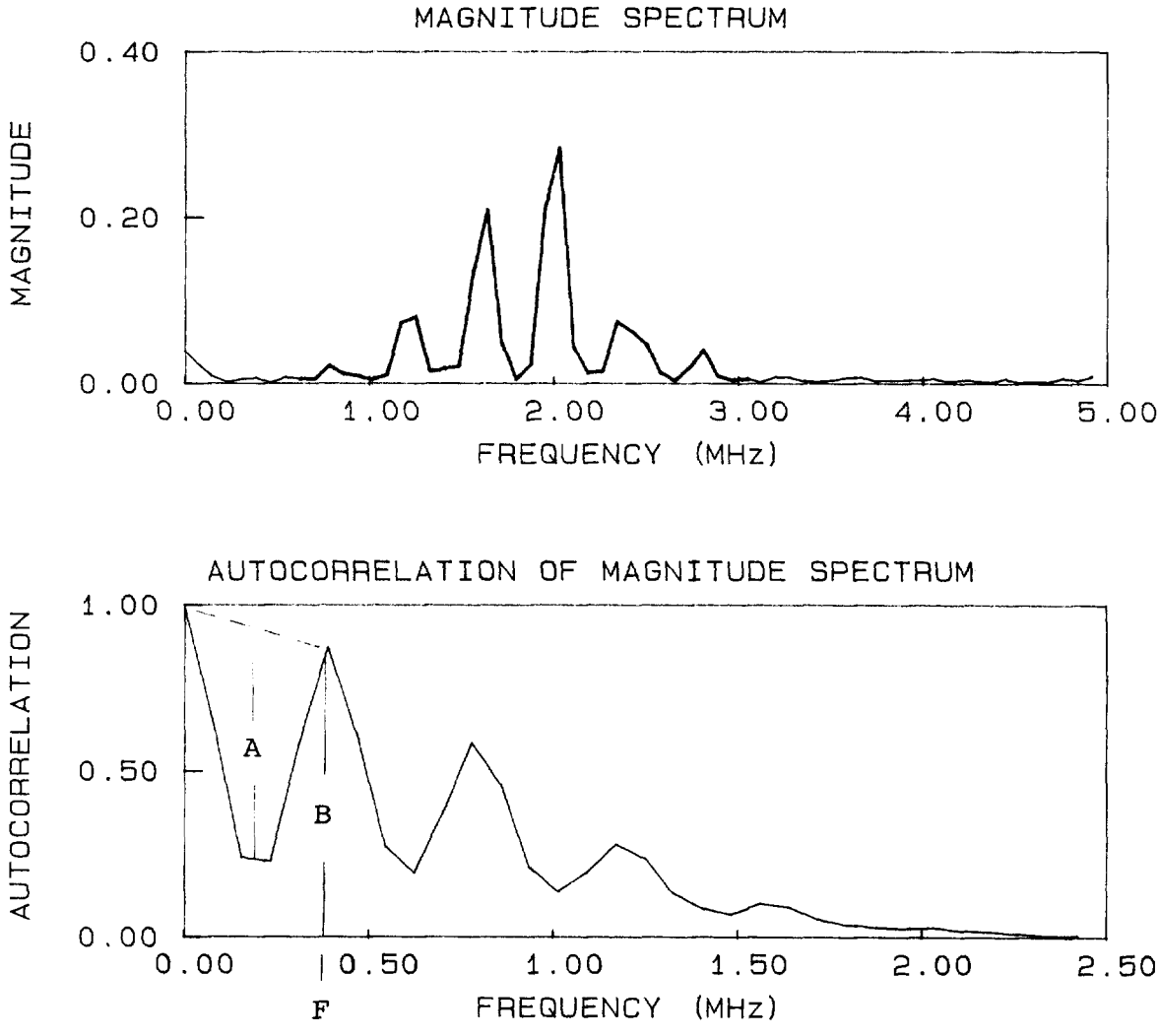

Figure 5. The magnitude spectrum and its autocorrelation for the signal of Figure 4b. Wall thickness is calculated from the position, F, of the first autocorrelation peak. The confidence level is the product of the peak height, B, and the valley depth, A.

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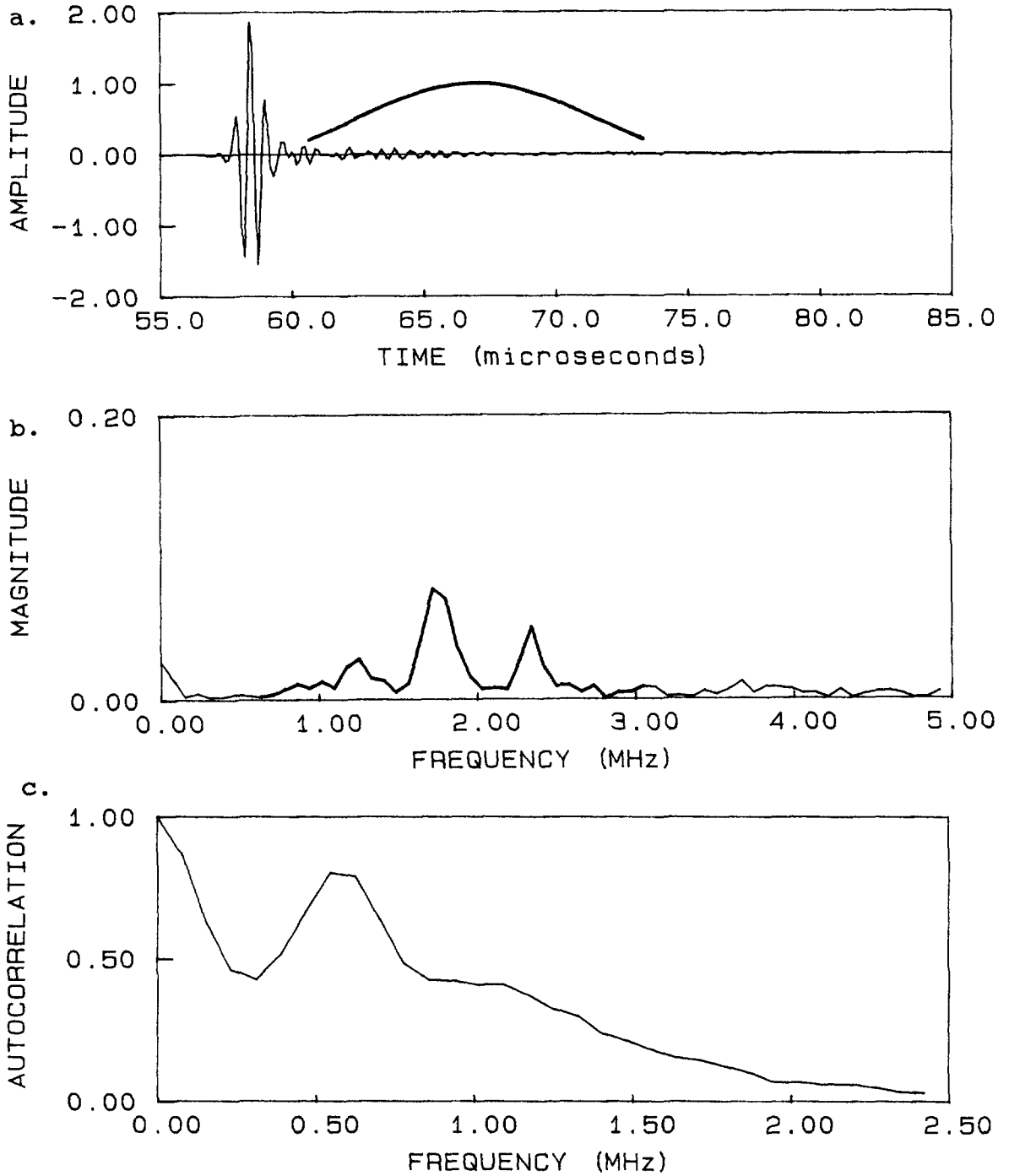

Figure 6. (a) Ultrasonic signal from casing corroded externally. (b) Magnitude spectrum showing resonance peaks farther apart than in Fig. 4. There are 3 distinct peaks well above noise level in the transducer band. (c) The autocorrelation of the magnitude spectrum has a well defined peak. The confidence level in this case was 3, which is the maximum on our scale of 0-3.

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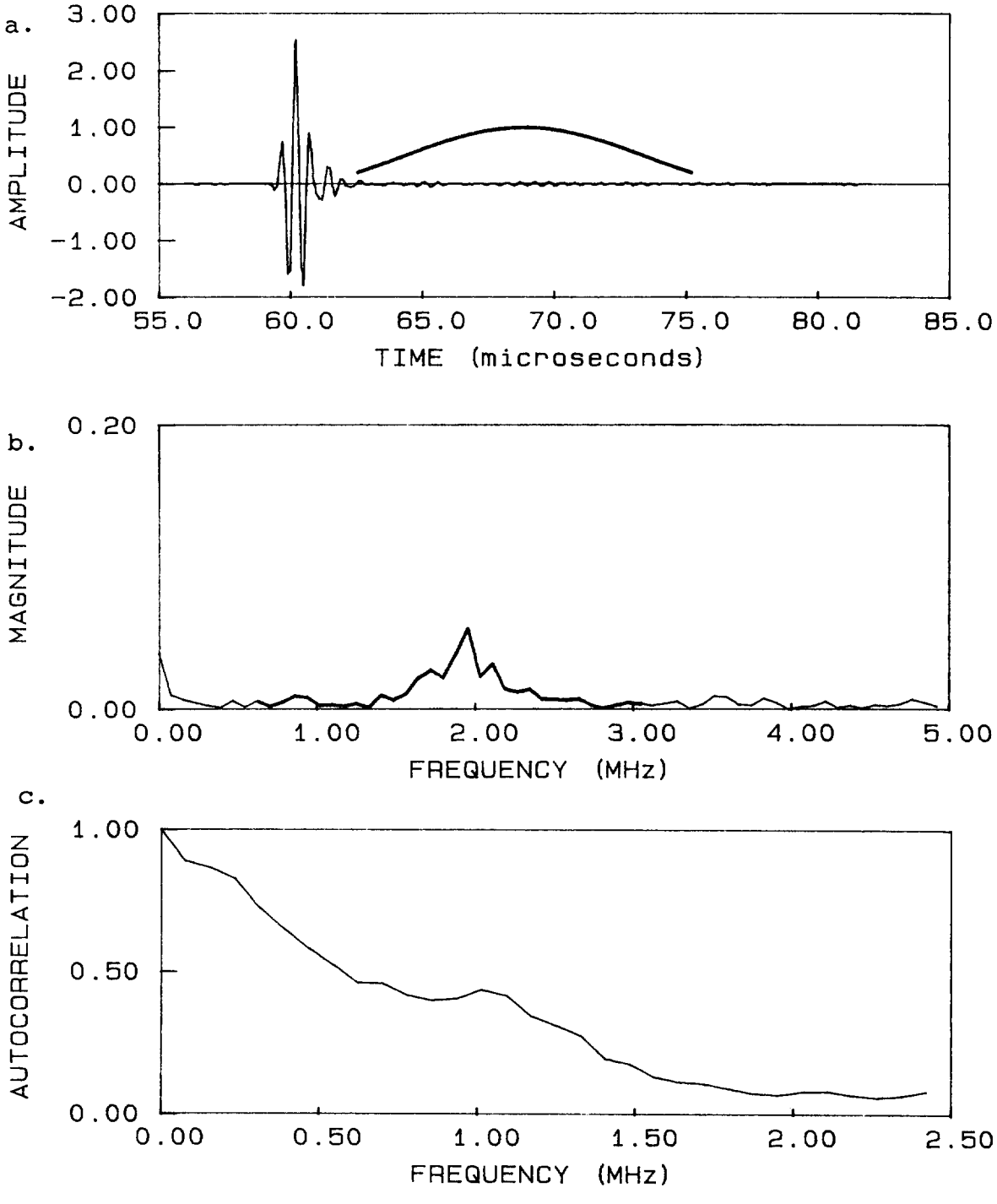

Figure 7. (a) Ultrasonic signal from casing corroded externally. (b) Magnitude spectrum with weak peak at 2 MHz and possibly another peak at 1 MHz down at noise level. (c) The autocorrelation of the magnitude spectrum has a weak peak at 1 MHz that may be due to casing reverberations. The confidence level in this case is 1 (again on a scale of 0-3).

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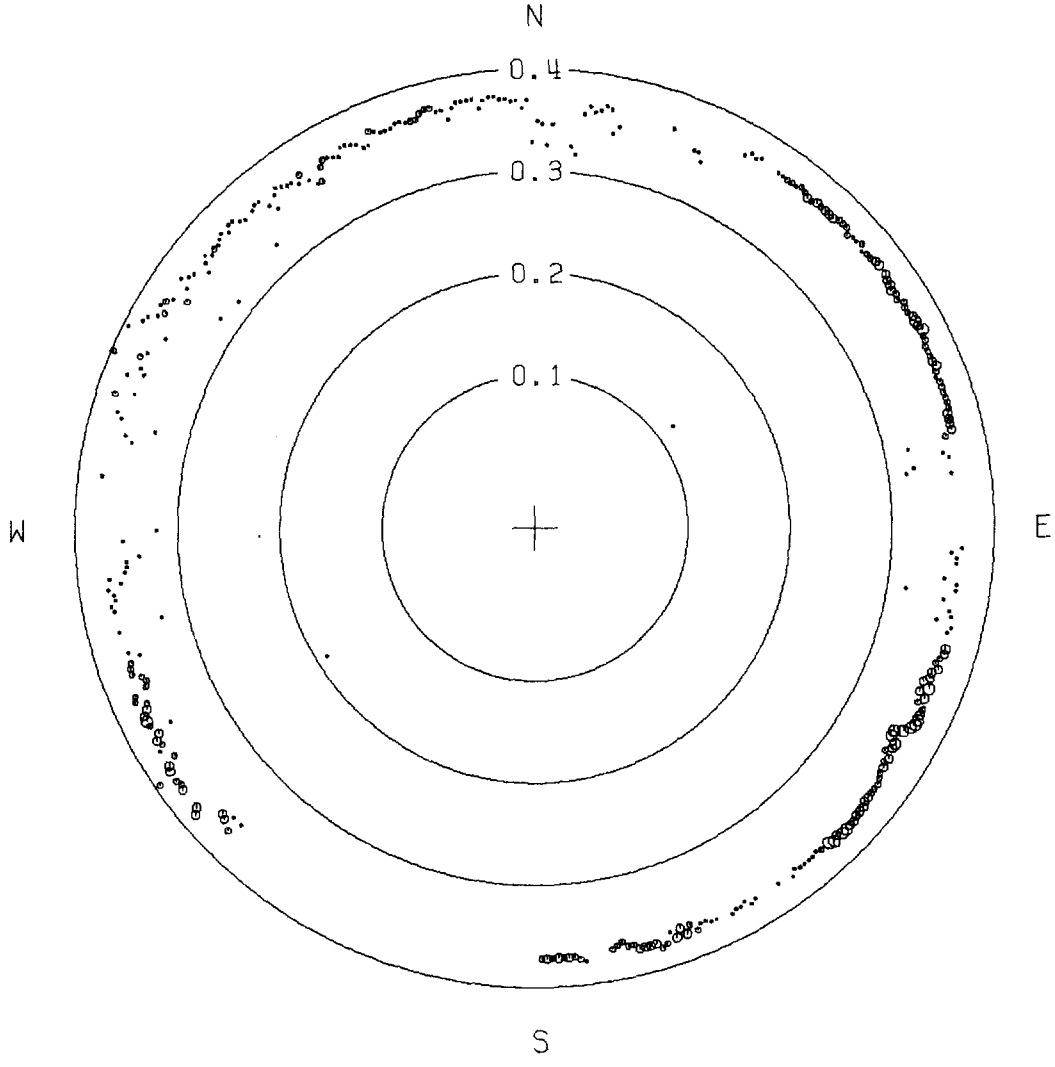


Figure 8. Polar plot of pipe wall thickness. The thickness is plotted as a linear function of radius. The true thickness measured with a calibrated high frequency ultrasonic thickness gauge is 0.362 in. The DUST thicknesses are shown as small open circles, and the confidence level is indicated by the size of the circle. Larger circles indicate higher confidence levels. There was no defect at this point on the pipe. The gap in the data at lower left is due to accidental erasure of a data file. Directions N, S, E, and W are shown only for reference.

SED SUR_REPLY_000577

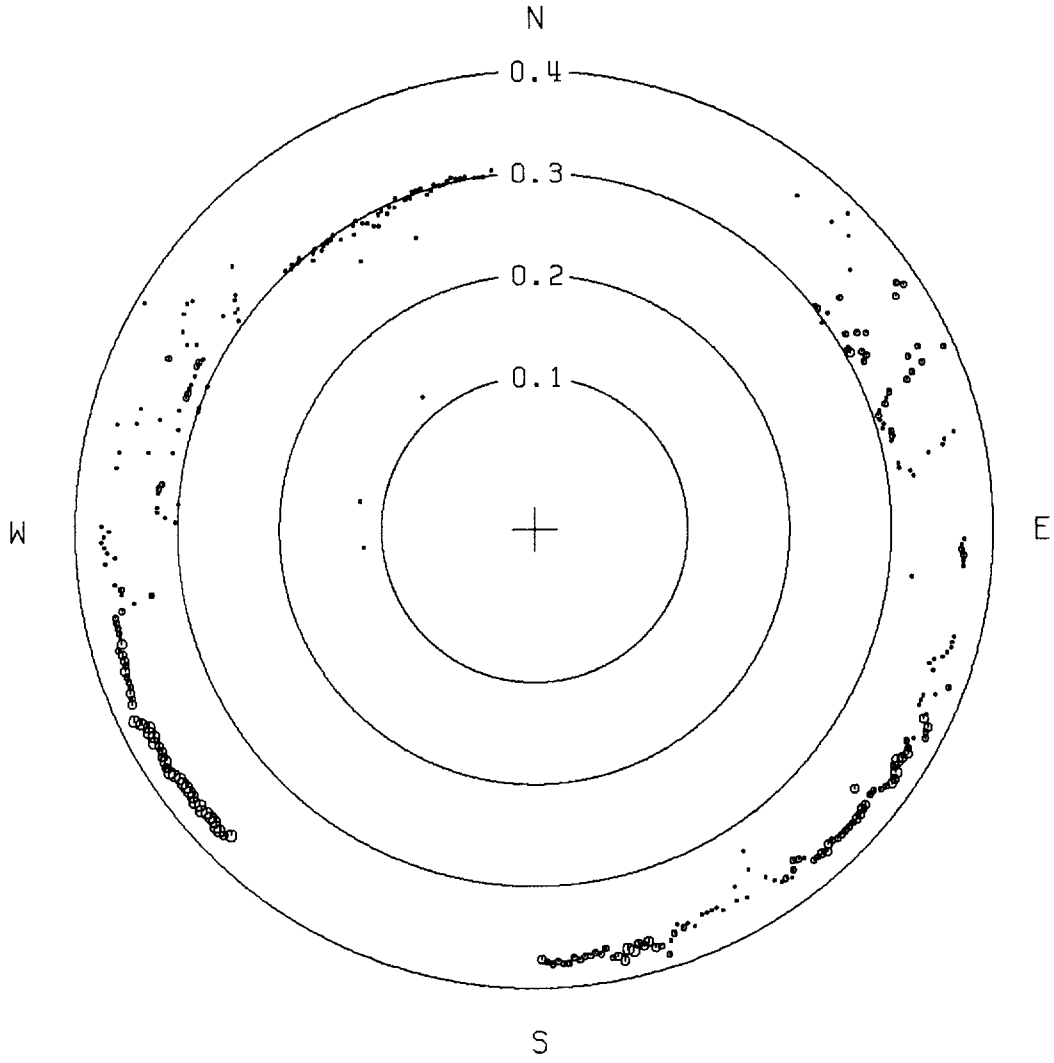


Figure 9. Polar plot of pipe wall thickness. The data is plotted as in Figure 8. Data points at the top of this figure come from points where the ultrasonic beam fell squarely on the groove. Elsewhere, the beam fell either on the unmachined pipe or on the edge of the groove. The true wall thicknesses were about 0.362 in. next to the groove, and 0.307 in. in the groove.

SED SUR_REPLY_000578

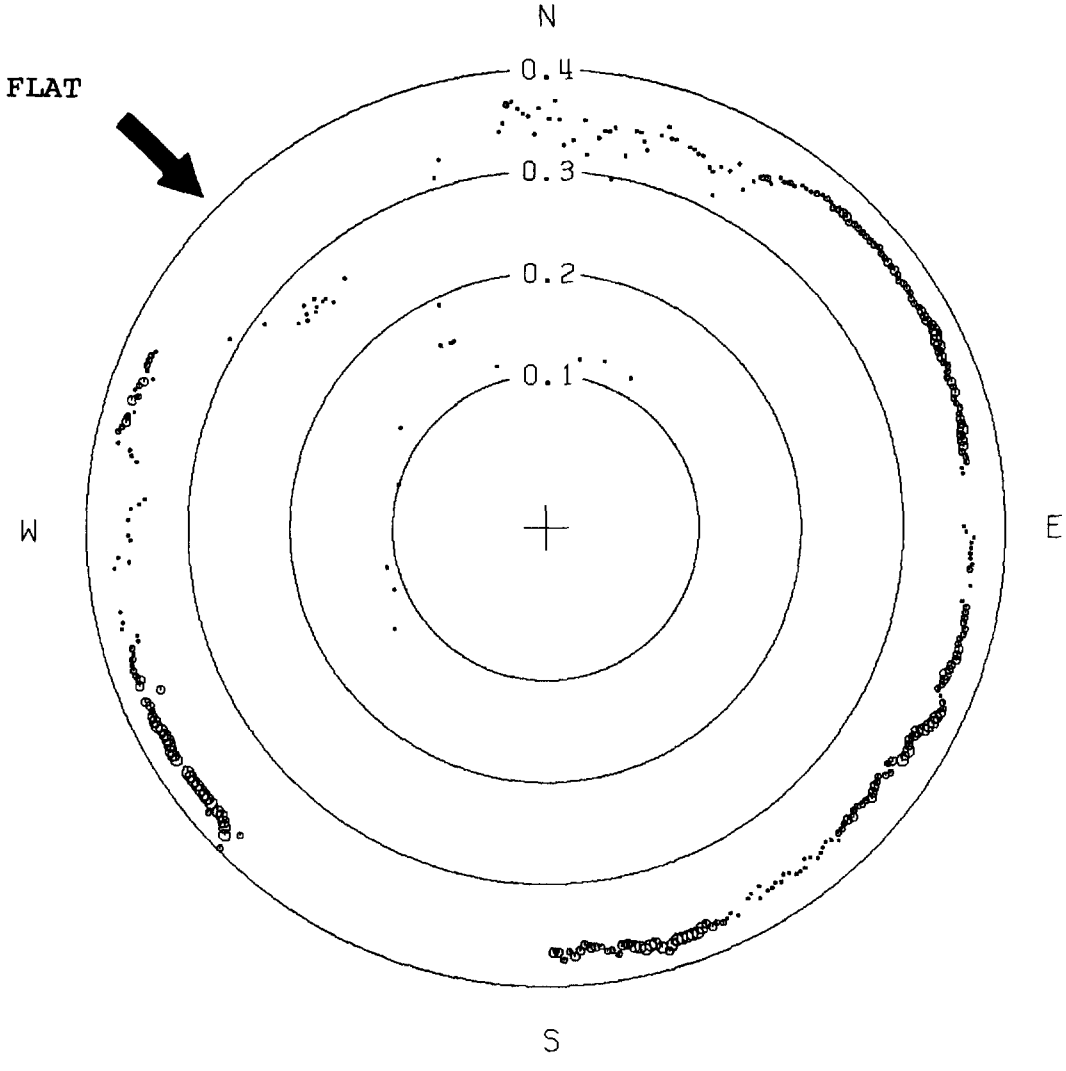


Figure 10. Polar plot of pipe wall thickness. The data is plotted as in Figure 8. The cluster of points at about 0.27 in. thickness at NW are from the center of a external flat machined on the pipe. The true minimum wall thickness was 0.271" at the center of the flat.

SED SUR_REPLY_000579

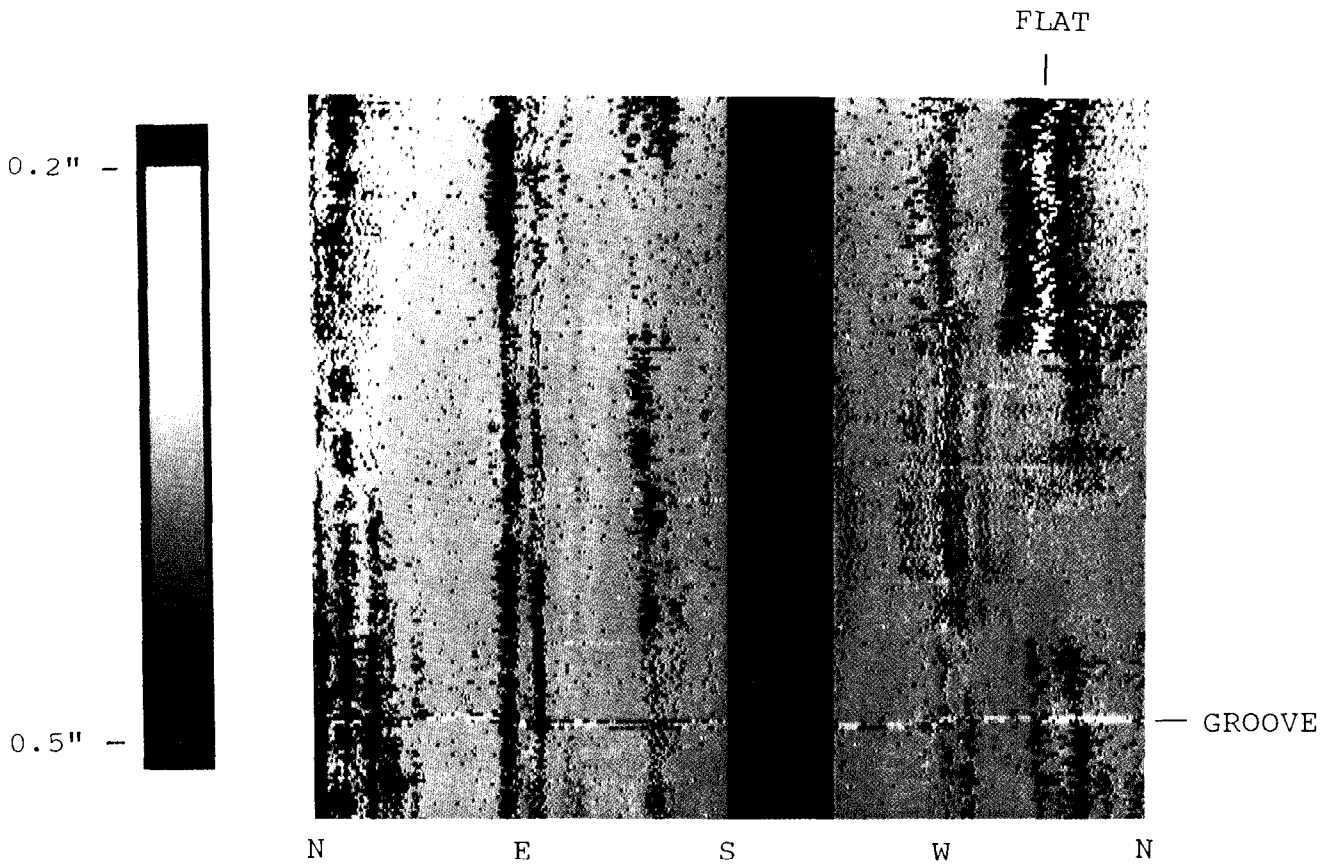


Figure 11. Gray-scale thickness image of pipe with machined external flat and groove. The image height corresponds to 5 feet of pipe, and its width corresponds to a circumference of about 15 inches. The gray scale is chosen so that dark points indicate thicker walls and brighter areas correspond to thinner walls. Black indicates that no valid thicknesses could be obtained from the data. The circumferential groove is near the bottom of the image. The external flat is at upper right. These are the same features shown in Figures 9 and 10. The black stripe through the image between S and SW is due to lost data.

SED SUR_REPLY_000580

With this passage in mind please answer the following:

a. When asked to produce electronic versions of Aliso Canyon well files in discovery, did SoCalGas provide versions of the well files that were in any way any of the following:
   i. Incomplete?
   ii. Inaccurate?
   iii. Otherwise not reflective of the actual well files?
   iv. If the answer to any of these questions is yes, please explain how.

RESPONSE 1:

i. No.
ii. No.
iii. SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "reflect." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. The electronic well files provided to SED are exact copies of the documents in the hard-copy well files. However, it seems the organization of the hard-copy well files (including that the files had pockets, fasteners, and additional file folders) may not have been captured in the electronic well files provided to SED, as reflected in SED's Opening Testimony (SED Opening Testimony at page 72: "The Well File for SS-25 is not kept in any particular order.").
iv. N/A.

Schlumberger

EM Pipe Scanner

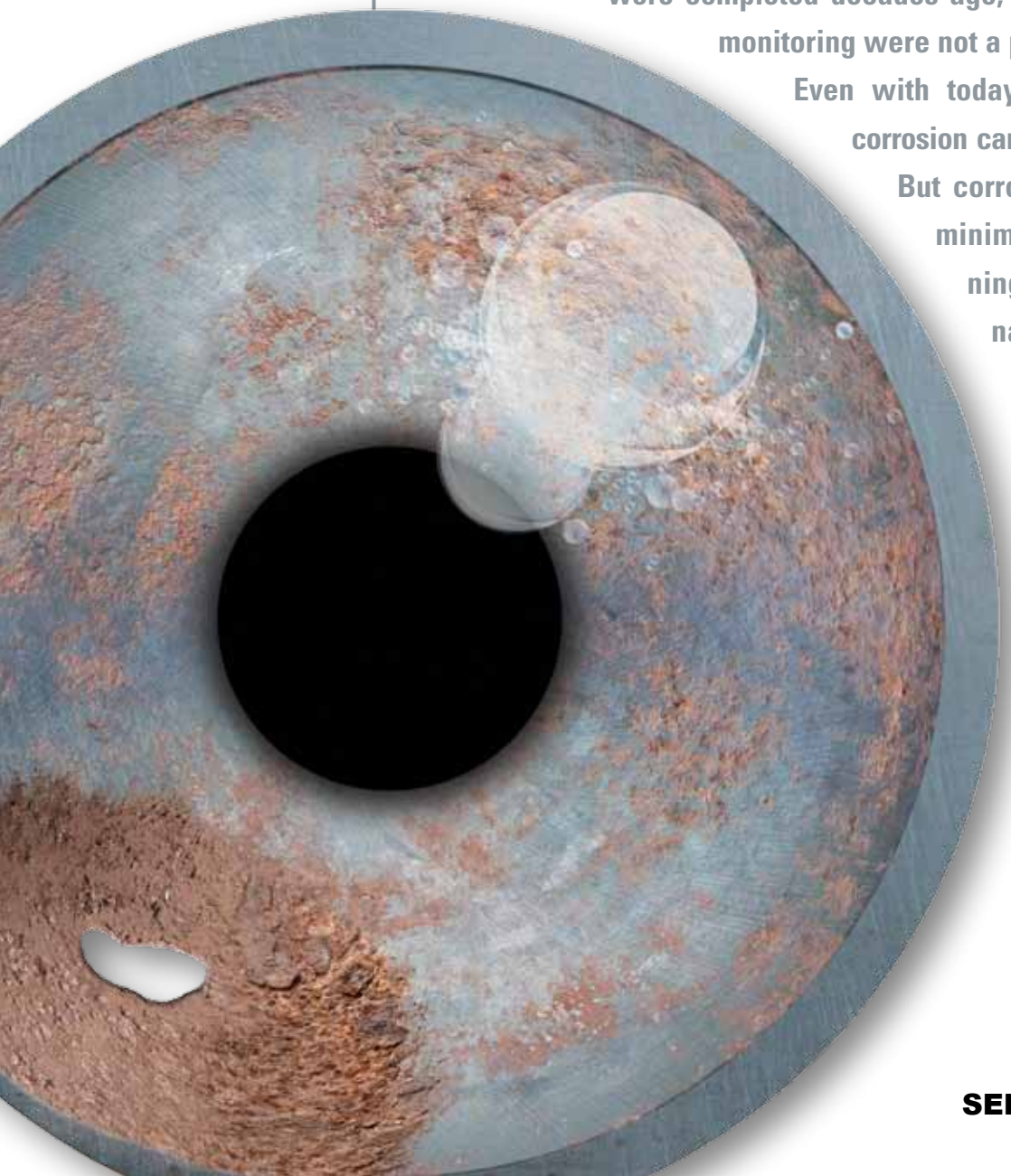
Electromagnetic casing inspection tool

SED SUR_REPLY_000582

Keep a closer eye on your casing

Monitoring for answers. Casing and tubing corrosion costs the oil industry billions of dollars annually—and this estimate does not include the cost of "lost oil" underground through corrosion-induced leakage and cross flow. Although early corrosion detection may allow preventive maintenance to reduce the risk of environmental damage and surface incidents (explosion, fire, leakage, and related consequences), many of the wells producing today were completed decades ago, when corrosion control and monitoring were not a primary concern.

Even with today's technological advances, corrosion cannot be completely prevented. But corrosion can be controlled and minimized through proper planning, monitoring, and maintenance. EM Pipe Scanner* electromagnetic (EM) casing inspection provides the critical monitoring step for evaluating casing integrity by locating, identifying, and quantifying damage and corrosion.



SED SUR_REPLY_000583

APPLICATIONS

- Quantitative evaluation of corrosion damage in single casing strings
- Qualitative evaluation in multiple casing strings
- Corrosion rate estimates from time-lapse comparison
- Identification of casing corrosion behind tubing
- Casing inspection below tubing string
- Determination of inner radius behind scale

The 18 pad sensors mounted on the centralizer arms of the EM Pipe Scanner tool deliver a low-frequency-EM thickness image and a high-frequency discrimination image.

SED SUR_REPLY_000584

Your first line of defense in flow assurance

COMPREHENSIVE MEASUREMENTS

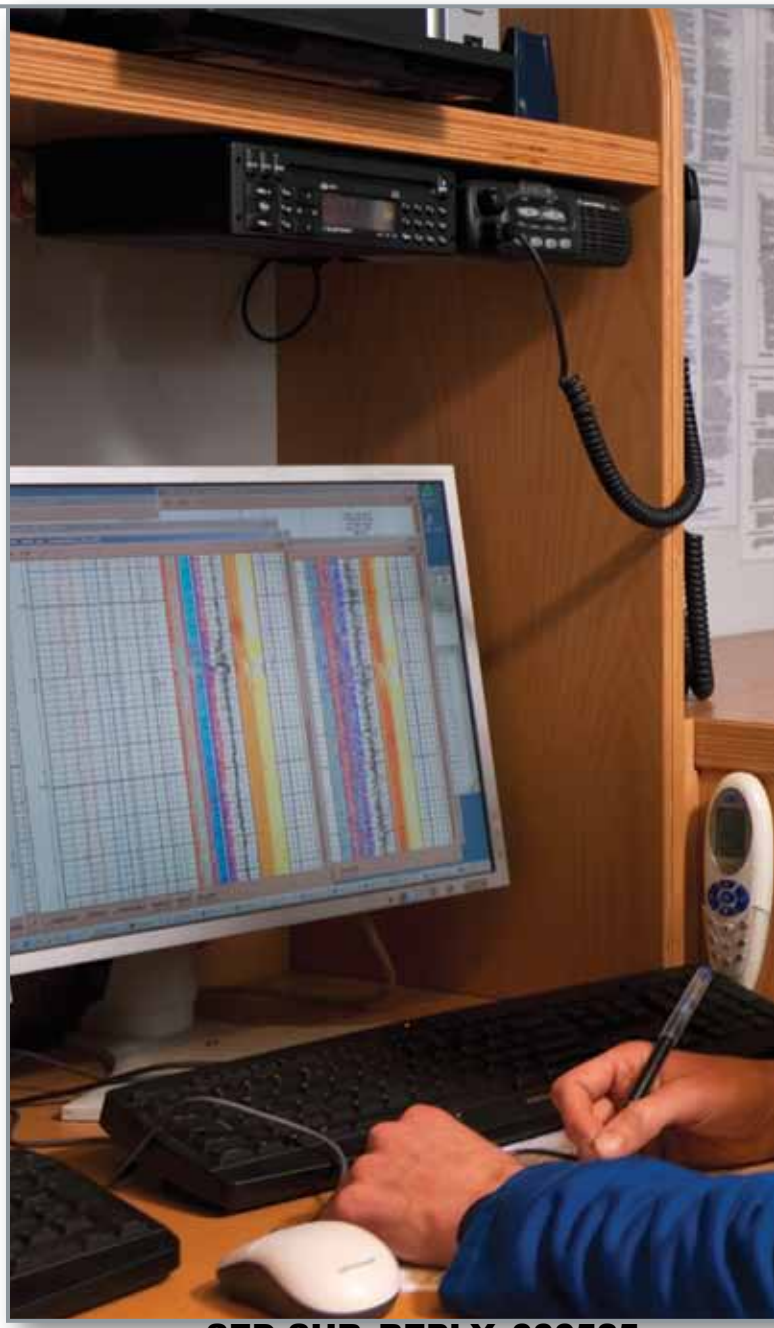
The EM Pipe Scanner EM casing inspection tool delivers valuable monitoring data even while running in hole. A continuous log of the average casing inner diameter and total metal thickness is recorded, either in single or double casing strings at speeds up to 3,600 ft/h [1,097 m/h]. This information is used to plan the acquisition mode of the upward pass.

For logging in single casing strings, the EM Pipe Scanner tool can be run in two modes: casing inspection mode at 1,800 ft/h [548 m/h] to identify any potential corrosion issues and then as required a slower diagnostic pass to pinpoint the exact severity and nature of the corrosion. In both modes a low-frequency image and high-frequency image are produced. A detailed casing summary report (CSR) is output for single-string casing surveys, listing average metal loss, maximum penetration, and histograms of the data joint by joint.

The EM Pipe Scanner tool also provides measurements to evaluate and identify corrosion in two concentric completion strings such as casing and tubing. The coil section of the tool determines the total-metal EM thickness of both strings combined but does not resolve the thickness of each string individually. Combined interpretation of the low-frequency thickness image and the high-frequency discrimination image enables determination of whether an observed metal loss is from the inner tubing wall or elsewhere.

OPERATIONAL VERSATILITY

With a slim 2.125-in [5.4-cm] diameter, the EM Pipe Scanner tool easily passes through tubing to evaluate casing below the tubing shoe and quantify metal loss in percentage and average ID of casing ranging from 2⅞- to 13⅜-in OD. Casing up to 9⅝-in OD is azimuthally imaged by the pad sensors on the tool's imaging section. The tool is fluid insensitive, operating in liquid or gas environments.



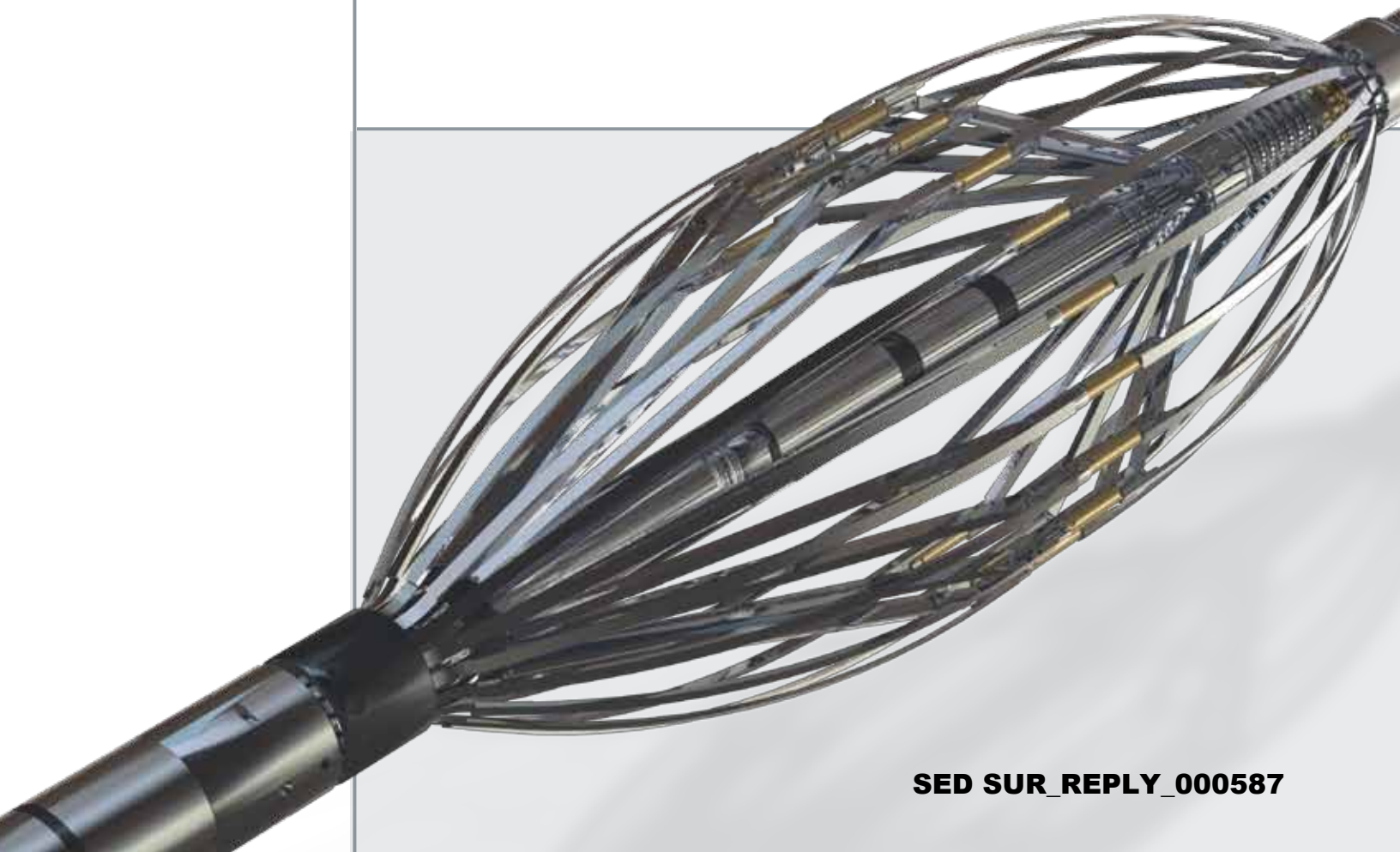
EM Pipe Scanner service was designed with versatility in mind. With a tool OD of just 2.125 in, it makes measurements in pipe ranging from 2⅞ to 13⅜-in OD. Plus, it can operate in liquid or gas environments.

Pinpoint your well's weakpoints

MEASUREMENT PRINCIPLE

The EM Pipe Scanner tool uses three types of noninvasive EM measurements to characterize well casings. These nondestructive induction methods employ both low- and high-frequency induction currents. Metal loss and changes in casing geometry are detected by combining the three measurement types:

- The imaging section provides two images: a low-frequency-EM thickness image for evaluating the remaining metal and a high-frequency discrimination image produced from 18 pad sensors mounted on the tool centralizer arms. The EM Pipe Scanner high-frequency image provides the status of the internal casing wall, as well as acts as a discriminator for defects in the inner or outer wall of single casing strings. In the log shown, the high-frequency image clearly identifies a groove in the internal wall of the casing as vertical black traces on the left side of the image. In addition, a casing split is obvious at 2,725 ft, in the middle of the joint body. A defect such as a casing split that has spread through the internal wall to the external wall of the casing is also depicted on EM Pipe Scanner low-frequency image.

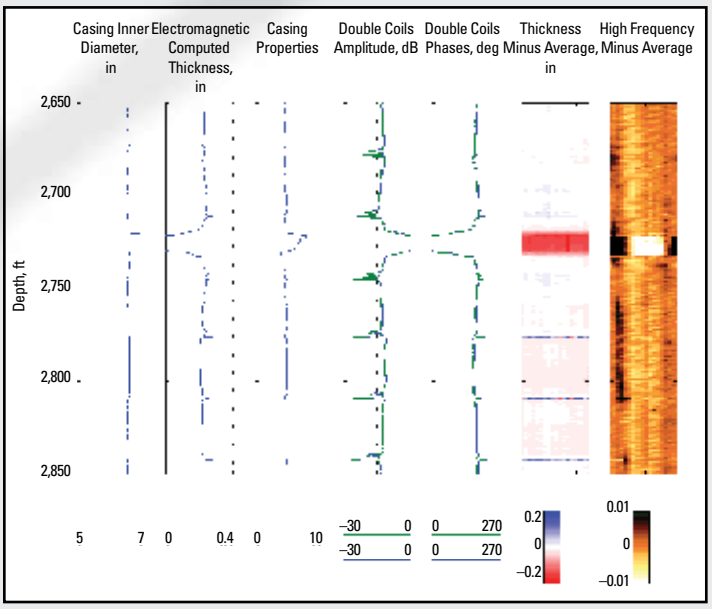


SED SUR_REPLY_000587

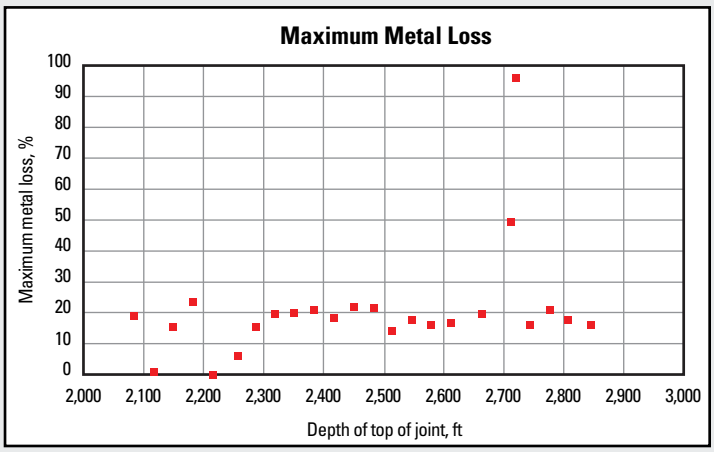
- The casing properties (CPR) measurement determines the surface impedance of the casing from the ID of the casing and the physical casing properties. The magnetic permeability and electrical conductivity of the casing are also a function of its physical properties.

- A series of mandrel receiver windings operating at low frequencies is used to extract the ratio of casing wall thickness to electromagnetic skin depth.

EM Pipe Scanner surveys quantify the percentage relative metal loss and average inside diameter (ID) of single casings ranging from about 2⅞-in to 9⅝-in OD. The maximum metal loss plot shown below, which is available at the wellsite, computes the metal loss joint by joint. The casing split evident on the high-frequency log image at about 2,725 ft is plotted as 100% metal loss.



Both a casing groove and casing split are evident in the EM Pipe Scanner log.



As part of the detailed EM Pipe Scanner casing summary report available for single-string surveys, maximum metal loss per joint is plotted at the wellsite.

Case Studies

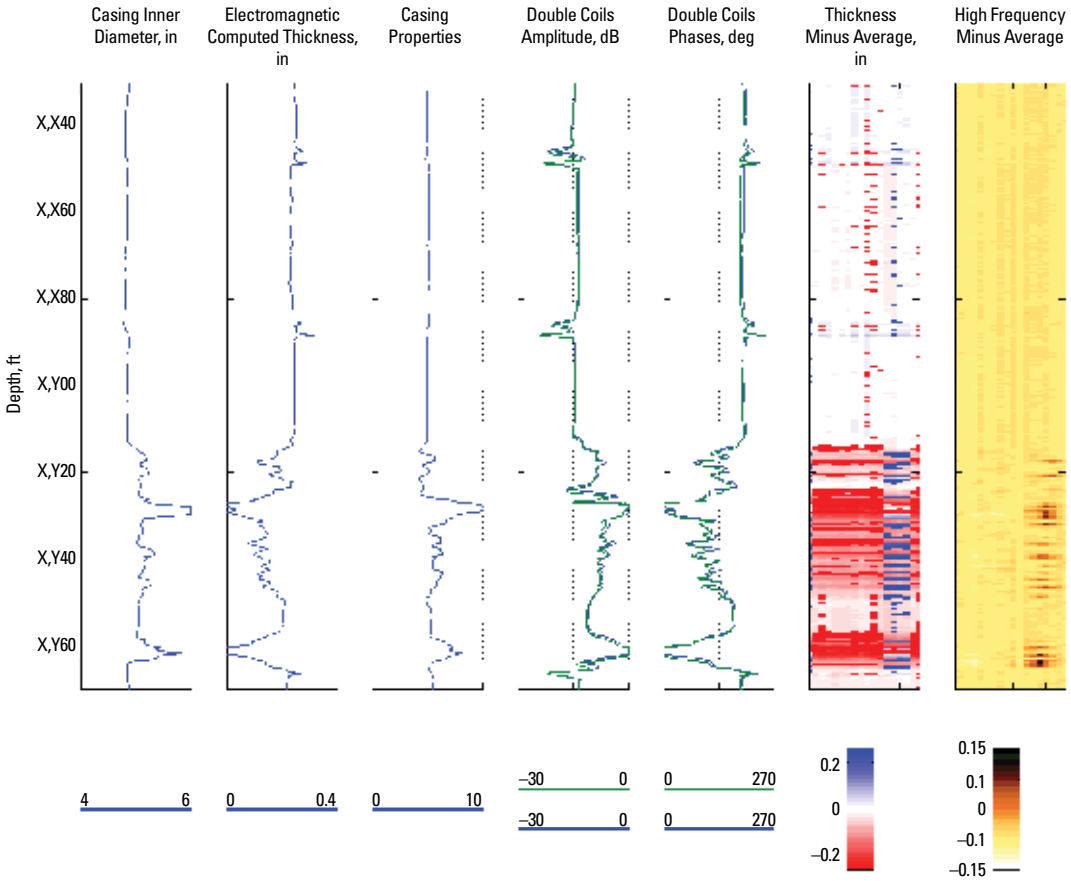
CORROSION IN THE PERFORATED INTERVAL

EM Pipe Scanner service revealed unexpected corrosion across the perforated zone in the 5½-in liner of a well. More corrosion is evident on the low-frequency image than the high-frequency one, which is a clear indication that the corrosion started from the outer wall of the liner and is removing metal from the outside to the inside, feeding the invasion of aggressively corrosive fluids from the formation to the metal and adversely affecting production.

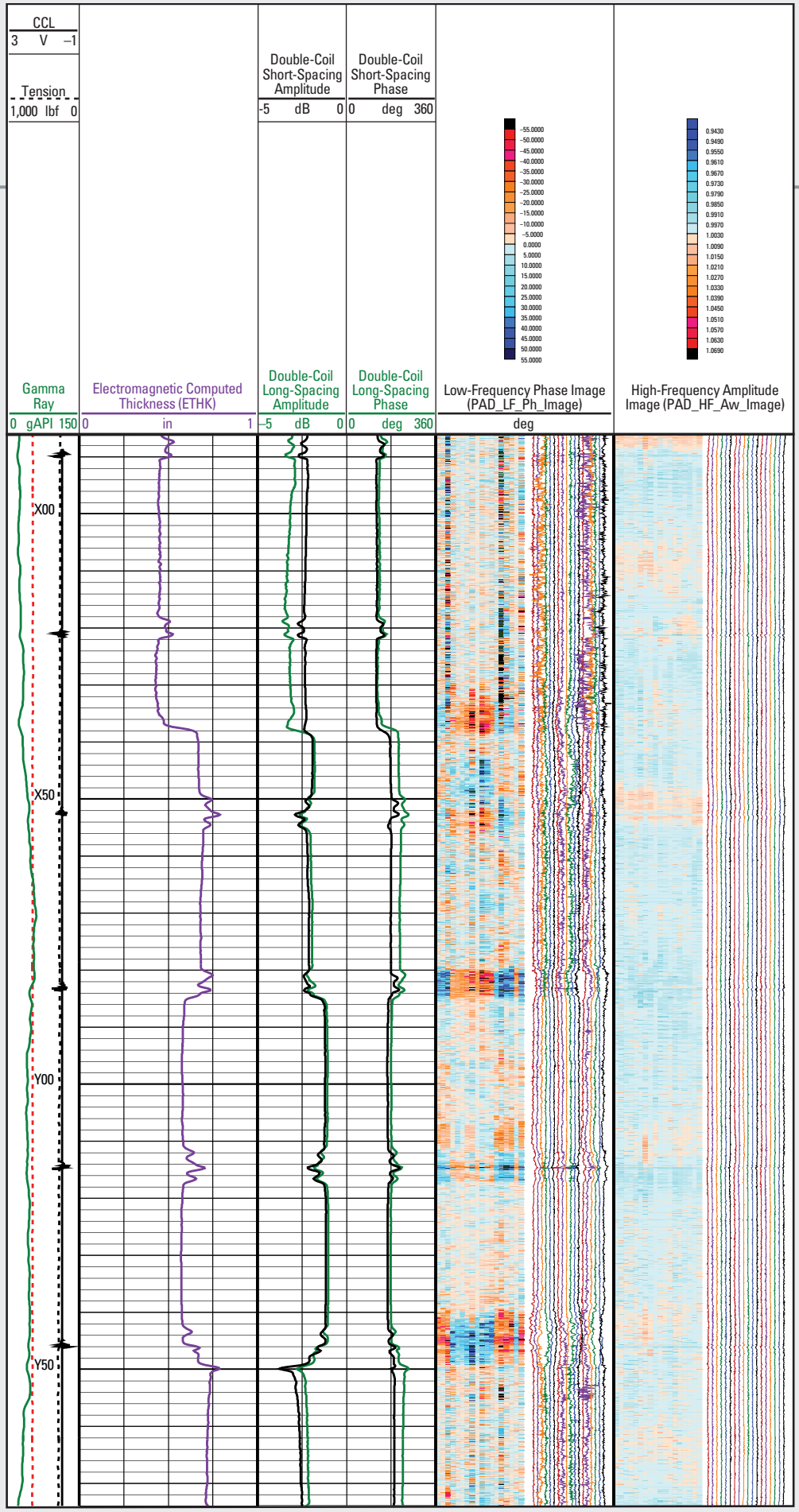
The level of detail delivered by the high-frequency image is shown by the readily identifiable manufacturing patterns and the obvious effect of a liner collar at the top of the log. The perforations are also clearly shown in the lower side of the liner.

The thickness computed from the EM Pipe Scanner measurements is consistent with that of 5½-in 15.5-lbm/ft liner with a nominal theoretical wall thickness of 0.275 in below and above the perforated zone.

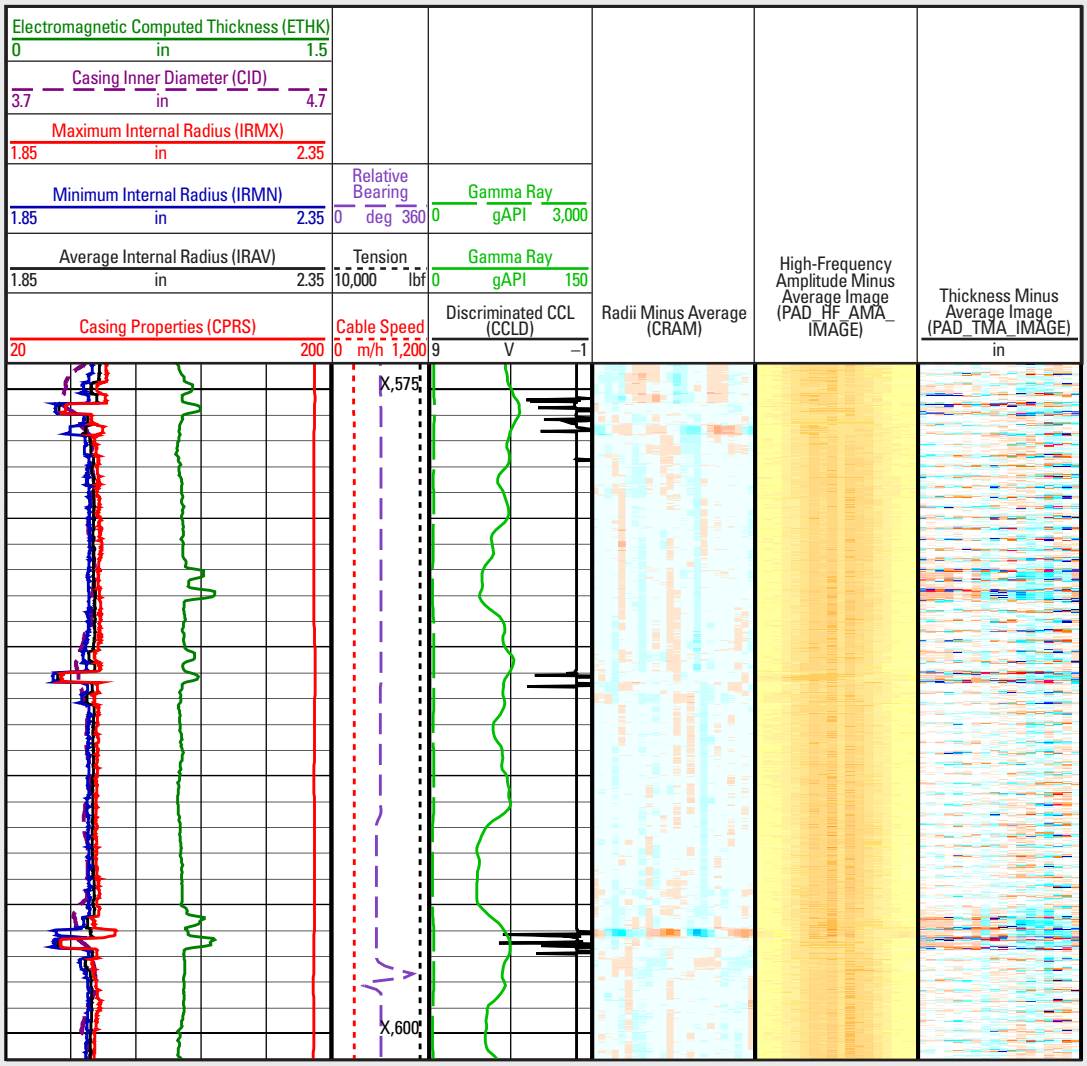
The EM Pipe Scanner low-frequency image from a double-string section in the same well revealed metal loss on the outer 9⅝-in casing joint, which was not seen by the high-frequency image or a PS Platform* Multifinger Imaging Tool (PMIT) log.



The EM Pipe Scanner low-frequency image (second track from right) shows corrosion in the external wall of the 5½-in liner in the perforated interval from X,Y15 to X,Y65 ft. The high-frequency image also images the perforations.



The EM Pipe Scanner ETHK curve identified a change in the weight of the outer 9⅝-in casing in two joints from X85 to Y50 ft that was not detected by the high-frequency image or PMIT logging.

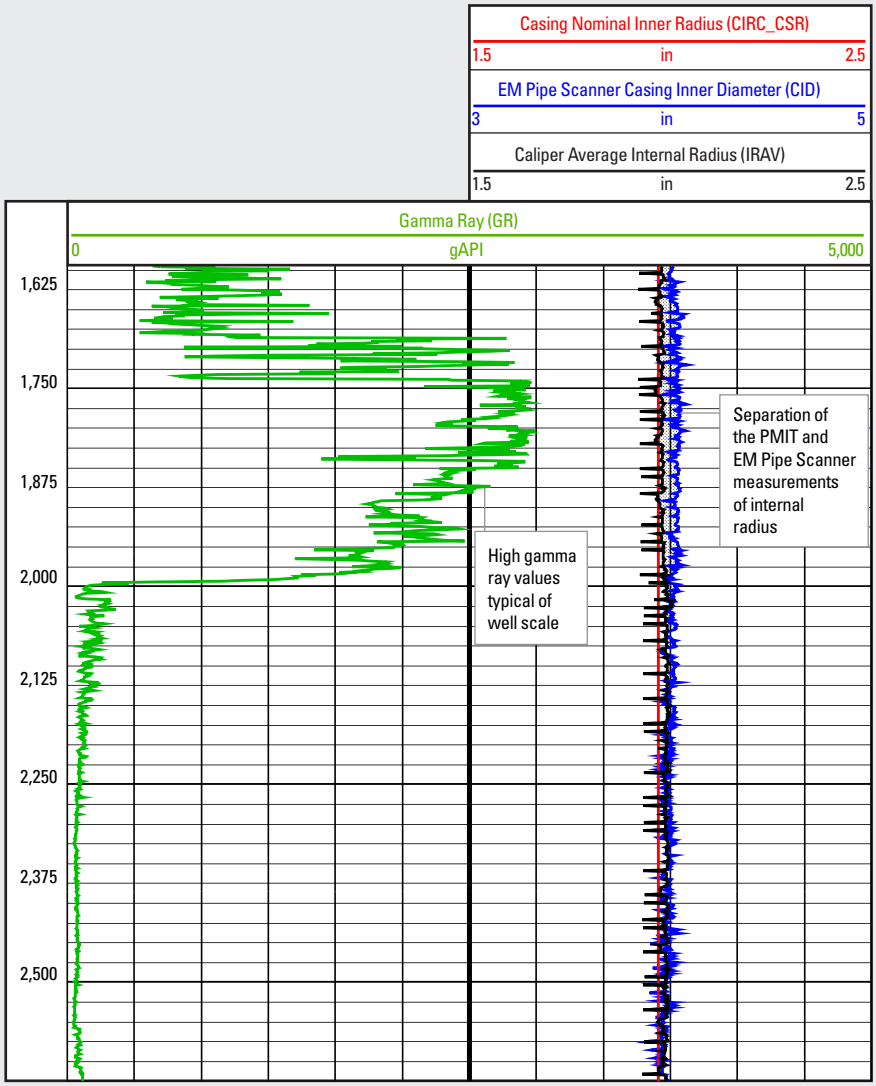


Combining EM Pipe Scanner and PMIT tools in the same string is an effective approach for identifying and evaluating both internal and external casing problems. The PMIT measurements of the internal radius in Track 1 are useful for identifying internal casing problems. EM Pipe Scanner measurement of the total thickness of double pipe in this well is within 5% of the nominal value, providing a good base measurement for future time-lapse monitoring of the casing condition.

METAL THICKNESS DETERMINATION BEHIND WELL SCALE

Multifinger calipers routinely calculate the inner radius from measurement of the inner pipe wall, but the unaccounted-for presence of well scale can impair measurement. In this situation EM Pipe Scanner logging can determine the remaining metal thickness for calculating the ID behind the scale buildup because EM Pipe Scanner measurements are insensitive to nonferromagnetic well scale.

Multifinger caliper tools, such as the PMIT, are a well-established technology for evaluating internal casing problems. However, calipers provide no information about external corrosion. Combining EM Pipe Scanner and PMIT tools in the same run in the hole can provide comprehensive corrosion evaluation for the inner tubing as well as the outer casing in double strings, with full discrimination between internal and external defects. EM Pipe Scanner measurements have a depth of investigation beyond the tubing to the external casing, capable of identifying corrosion and other features, including accessories such as centralizers and collars.



The presence of well scale in 4½-in tubing is indicated by the high gamma ray values and separation of the EM Pipe Scanner and PMIT measurements of the internal pipe radius. The measurements agree well up to 2,033 m, from where they steadily diverge. The difference is used to quantify the scale buildup for monitoring with time-lapse logging.

Measurement Specifications	
Output	EM thickness, casing ID, casing properties, high- and low-frequency images, corrosion summary report†
Logging speed	ETHK (single and double strings): 3,600-ft/h [1,097-m/h] inspection pass for mandrel data
	Imaging (single string): 1,800-ft/h [549-m/h] standard-resolution inspection pass; 300-ft/h [91-m/h] high-resolution diagnostic pass
Range of measurement	Maximum metal thickness‡: 1.5 in [3.81 cm] at 8.75 Hz
Resolution	Attenuation < 60dB: 1%
	EM thickness: 15%§
Accuracy	Casing ID: ±0.05 in††
Mud type or weight limitations	Any borehole fluid
Combinability	All PS Platform services
	Multiple-tool answer products
Special applications	NACE compliant for H_2S and CO_2 resistance

Mechanical Specifications	
Temperature rating	302 degF [150 degC]
Pressure rating	15,000 psi [103 MPa]
Casing size—min.	2⅞ in (ID > 2.313 in)
Casing size—max.	13⅜ in for EM thickness
Outside diameter	2.125 in [5.4 cm]
Pad sensor arms	18 coupled
Max. diameter	9⅝-in casing
100% image coverage	7-in casing
Length	19.7 ft [6.0 m]
Weight	110 lbm [50 kg]
Tension	Fishing: 10,000 lbf [44,480 N]
Compression	Fishing: 3,000 lbf [13,340 N]

† Corrosion report for single casing strings

‡ Measurement depends on casing geometry, properties, and chrome content.

§ The resolution depends on the accuracy of casing electrical conductivity (sigma). The usual method is to use API specifications in a "good" casing section and adjust conductivity to match the nominal value, which has a typical 12.5% range (Oil Country Tubular Goods, API Spec 5CT, Specification for Casing and Tubing)

†† Casing ID (d_{ci}) < 6 in and tool eccentered = [30% × (d_{ci} – 2.2 in)]

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UL

DETECTION OF EXTERNAL PIPE DEFECTS WITH A MODIFIED BOREHOLE TELEVIEWER

by K. W. Katahara, D. G. Kyle, R. W. Siegfried, M. F. Gard,
W. P. Goodwill, T. Schasteen, and S. G. Petermann
ARCO OIL & GAS COMPANY

Abstract

The conventional ultrasonic televiewer is capable of precise and detailed mapping of the topography of the borehole wall or of the inner surface of casing and production tubing. ARCO has recently designed, built and tested a new televiewer that is also capable of determining pipe wall thickness with the same detail. The major functional modifications in ARCO's tool relative to the previous televiewer are (1) that the ultrasonic transducer is exposed directly to the borehole fluid without an intervening window; and (2) that the ultrasonic signal is digitized downhole for later transmission up the wireline. A microprocessor in the tool controls the measurement process and can perform significant portions of the signal processing downhole. Although the system was designed to do real-time calculations, the data are currently recorded at the surface and are subsequently processed to obtain thicknesses. A lateral resolution of 1/4" and a wall thickness accuracy of 0.01" are possible. The minimum resolvable wall thickness depends on the ultrasonic bandwidth and is about 0.1" for the transducers used to date. The prototype tool has been tested in pipe with well-characterized external defects, and some examples of test results are shown. The thickness data are displayed as pseudo-color images or as cross-sections or polar plots. The areal extent of defects can be mapped out with precision, but quantitative thickness data can be obtained only where the inner and outer pipe surfaces and the ultrasonic wavefronts are approximately parallel. Fortunately this normally includes wall thickness minima. Although the initial goal was to detect exterior corrosion on pipe, other applications such as cement bond logging are possible.

Introduction

A number of logging tools are in use for detecting corrosion or wear on the inner surface of casing or tubing. The borehole televiewer (BHTV) is notable among these for having very dense coverage of the inner pipe surface together with good resolution of the depth of defects. As discussed in a later section, currently available tools which detect defects on the outer surface of the pipe tend to lack resolution, be unreliable, or have incomplete coverage of the surface. Because of a need for accurately characterizing external casing defects, ARCO has carried out extensive modifications to the BHTV to enable it to determine the pipe wall thickness with the same resolution and coverage that it gives in conventional applications. This paper describes the resulting prototype "digital ultrasonic scanning tool" (DUST), and some early test results.

The ultrasonic borehole televiewer (BHTV) was first developed at Mobil (Zemanek et al., 1969) to image the borehole wall. Improvements in the recording and display systems, and the introduction of image processing techniques and travel-time (caliper) measurement capability (Wiley, 1980;

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Broding, 1981; Pasternack and Goodwill, 1983; Taylor, 1983) enhanced the utility of the BHTV, and it has since been widely used.

The BHTV uses a piezoelectric transducer to send an ultrasonic pulse out from the tool as shown in Figure 1. Returning echoes are received by the same transducer. Electronic circuits measure the amplitude and travel-time of the echo from the inner surface of the tubing or casing. The transducer rotates at three revolutions/second and is pulsed about 500 times per revolution as the tool moves uphole. The ultrasonic spot size is usually large enough to provide complete coverage of the casing surface at a logging speed of 5'/minute. Corrosion on the inner surface shows up as an increase in echo travel-time and a decrease in echo amplitude, and detailed images of the depth and lateral extent of damage can be produced (e.g., see Zemanek, 1969; Broding, 1984; Pasternack and Goodwill, 1983; and Rambow, 1984).

Our design goals were to modify the BHTV to measure casing thicknesses in the range of 0.06" to 0.6" with an accuracy of 0.01" (.25 mm). We wanted a versatile tool that would also have conventional BHTV capabilities in both cased and open hole applications. We wanted a reliable tool that would produce high-resolution images, preferably in real-time. For our purposes, "real-time" means that the thickness at each point must be measured in about a millisecond or less. Major problems were optimizing the ultrasonic signals, handling the tremendous amount of generated data, and coping with the limited bandwidth of the wireline. These problems required such extensive modifications to the BHTV that the result is essentially a new tool. It will become clear in the following discussion that although the Digital Ultrasonic Scanning Tool (DUST) does not meet all of our design goals, it comes close in many respects.

Tool Description

The DUST is shown in Figure 2. It is a 3.25" diameter tool that has so far been tested as a whole to 300 F and 8000 psi. Portions of the electronics have been qualified from -67 to 347 F and testing of the complete tool in adverse environmental conditions will continue. The major mechanical difference from the BHTV is that the ultrasonic transducer is mounted on a rotating head at the bottom of the DUST exposed to the borehole fluid. We became aware shortly after starting this project that ultrasonic reverberations due to the BHTV acoustic window, which separates the rotating transducer from the mud (Zemanek, 1969), were causing the ultrasonic pulse to be undesirably complicated for thickness measurements. We therefore eliminated the window and placed the transducer in contact with the mud. The transducer head is at the bottom of the tool to reduce the number of rotating seals and the associated drag. We have a small but growing collection of piezoelectric transducers, each mounted in its own head with impedance matching circuitry included.

In choosing transducers, there is a tradeoff between good thickness resolution and the need to inspect rough pipe surfaces in thick muds. Given a limited amount of signal processing time, good thickness resolution requires broad frequency bandwidth, but higher frequency ultrasound is attenuated greatly by muds and by reflection from rough casing surfaces. We need to use as low a frequency as possible consistent with our goal of resolving thin pipe walls. Our tests to date have employed fairly broadband transducers with usable energy

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between about 1 and 2.7 MHz, which gives a minimum resolvable wall thickness of about 0.1" with our current thickness determination method. If faced with heavy muds, we can give up some resolution and use lower frequency transducers.

Figure 3 shows a simplified functional diagram of some parts of the DUST electronics. The heart of the system is a Texas Instruments TMS320C25 digital signal processor (DSP). The DSP is a very fast chip which performs control and communications functions in addition to signal processing. It provides a great deal of flexibility in that many DUST functions can be modified either through a digital downlink from the surface, or by reprogramming the erasable-programmable-read-only-memory (EPROM) in the tool.

To begin with, the transducer is driven by an arbitrary waveform sent to the DSP from the surface. This is often a simple spike pulse, but it could be a complex waveform chosen to optimize the received echoes. For instance, if the impulse response of the the transducer is measured, then an inverse filter could be used as the transducer excitation in order to obtain echoes which are highly compressed in time (Schafer and Lewin, 1984).

The DSP also controls blanking and gain of the receiver circuits. The receiver gain is variable over a 37 dBV range. Since the driving waveform amplitude is also adjustable, the effective gain range of the system is much higher. The filtered and amplified echoes are digitized by an 8-bit flash A/D (analog to digital) converter which sends the data to the DSP for processing. Ultimately, we hope that the DSP will perform thickness computations downhole and send only the results, or a greatly compressed data set, to the surface. We believe this to be possible with some care in choosing and coding the algorithm. However, at least during the testing phase, we wish to examine the raw ultrasonic data. Thus we need to get large amounts of data (on the order of a Megabit/sec) up the wireline, which may have a bandwidth of only a few tens of kHz.

We do this by only transmitting the parts of the waveform that contain essential information. Currently, we digitize 32 samples from the initial inner surface echo at 67 ns intervals, and 128 samples from the casing resonance sequence (Figure 4) at 100 ns intervals. Thus we need to send about 160 bytes up the wireline in addition to timing and other information. This is done by clocking the data out with a D/A (digital to analog) converter at a rate slow enough that the stretched analog signal survives transmission up the wireline. Depending on the length of the wireline, it may be necessary to reduce the transducer pulse rate to allow more time for stretching the signal. For instance, we can operate at a pulse rate of about 200 per rotation (600 pulses/second) for a 20 kft wireline. This still allows full coverage for most pipe sizes.

The pulse rate and the cable-driving D/A rate can be set from the surface. We can also vary, either in software or firmware, the digitizing rate, the trigger level for data acquisition, the number and position of the samples, and other parameters. Various quality control functions are also performed by the DSP on command from the surface.

At the surface the stretched ultrasonic signal is written to tape in analog form for later digitization and processing. An IBM AT-compatible computer is used to

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control communications with the DSP downhole, and eventually will be used for on-site processing, recording, and display when the real-time casing thickness computation is implemented.

Thickness Calculation and Display

Several methods of calculating thickness from the ultrasonic signal have been considered. The one described here is reliable and straightforward, though slow in execution. The received signal consists of an large initial echo from the inner casing wall followed by a series of much smaller casing reverberation echoes (Figure 4), which are opposite in phase to the first echo. Thicknesses are obtained by measuring the periodicity of the casing reverberations. We digitize a portion of the signal coming after the initial echo has died off. The data is tapered and Fourier transformed, and the resulting power or amplitude spectrum is autocorrelated (Figure 5). If there are two or more casing harmonics in the spectrum, there will be a strong peak in the autocorrelation at a lag equal to the fundamental resonance frequency of the casing,

$$F = V/2L$$

where V is the velocity of sound in steel (6 mm/us) and L is the casing wall thickness. We use a quadratic interpolation scheme to pick the peak position, F. Autocorrelation of the spectrum has some drawbacks, but it avoids ambiguities in identifying harmonics. From the standpoint of processing speed, it is perhaps worth noting that the autocorrelation of the spectrum contains much the same information as the spectrum of the squared time signal.

We also define a rough measure of confidence in the thickness determination (see Figure 5):

$$C = AB$$

where B is the normalized height of the first autocorrelation peak, and A is the depth of the valley at the midpoint between the peak and the origin. In other words C is the product of B, a measure of the energy in the casing resonance, and A, a measure of the contrast between the resonance peak and the background noise. Figures 6 and 7 show examples of high and low confidence level signals respectively. In practice we can usefully distinguish four discrete confidence levels (stored digitally as a two bit integer).

We have also tried various ways of displaying the thickness data. Probably the most effective is a pseudo-color image in which the thickness is indicated by the hue, and the confidence by the saturation or brightness. Here we will show gray-scale images with thickness indicated by brightness. At any given depth it is also possible to plot a cross-section or a polar plot of wall thickness.

Test Results

The prototype DUST was completed in 1987. It has been tested to high pressure, high temperature, and over long wirelines. Its thickness measurement capability has been tested in pipe with artificial defects as well as in naturally corroded pipe. The data discussed below is from a test in which the prototype tool

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was run in 5.5" O.D. by 4.6" I.D. pipe with an exterior machined flat and an exterior circumferential flat-bottomed groove.

These figures contain some artifacts which need explanation. At the time this data was processed, our digitization system required that the analog recorded data be digitized in eight passes, each covering a 45 degree section of the pipe. Furthermore, data was digitized usually from every other rotation, except that two rotations were occasionally skipped in an unpredictable pattern. Thus the different passes start at slightly different points and have slightly different vertical sampling rates. (A new digitization system has been completed but there has not been time yet to reprocess the data.)

Figure 8 is a polar plot of wall thickness in a region without defects. The confidence level for the thickness determination is indicated by the symbol size, the largest symbols being most reliable. The "true" average thickness (0.362") as measured with a high resolution ultrasonic thickness gauge is in good agreement with the DUST thicknesses.

Figure 9 is a polar plot of data at the circumferential groove. The data from NW to NE are from within the groove area. (The north, south, east and west directions are shown only for reference). Elsewhere, the thicknesses are generally indicative of the area outside the groove. The thicknesses at and outside the groove are again in good agreement with the true thicknesses.

Figure 10 is a polar plot of data at the machined external flat. The cluster of points at about 0.27" wall thickness at the NW is from the center of the flat. The points in the cluster individually have a low confidence level, but are more credible taken as a group. Furthermore, similar clusters are seen in rotations above and below, so the vertical continuity makes the thickness measurement more credible. Thickness measurements are not obtained from the flat except at its center because the ultrasound is reflected at too large an angle to return to the transducer.

Figure 11 is a gray-scale image of about 5 feet of the pipe joint described above. Black indicates that valid thickness measurements were not obtained. Valid thickness values are shown such that thinner areas are white and casing of normal thickness is gray. The dark stripe at upper right is the external flat, and the white stripe through its center is the data from the center of the flat. There is a thin line near the bottom of the image which is produced by the circumferential groove. This image illustrates the televiewer-like areal resolution of the DUST. The circumferential groove is 0.5" wide. The DUST sees the groove and determines accurate wall thickness values over much of the groove circumference. Likewise the external flat is well-defined areally, though wall thicknesses are determined only at the center of the flat. This is a general feature of DUST thickness images. We can see the lateral extent of defects very well, but accurate thicknesses are obtained only where the inner and outer pipe surfaces are roughly parallel to each other and to the transducer face. Fortunately this usually includes areas where the wall thickness is a minimum.

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Comparison with Other Casing Inspection Tools

Several tools are used to detect downhole corrosion. Caliper tools have fair azimuthal resolution, but of course are completely insensitive to corrosion on the outer surface of casing. ARCO has recently built an improved tool for measuring galvanic potential, thereby identifying corroding intervals. This tool and others like it are more suitable for identifying problem areas than for detailed inspection.

Flux leakage and eddy current tools can be sensitive to the intrinsic casing magnetic and electrical properties. Since these properties can vary significantly from point to point on uncorroded casing, these techniques can give false indications. These tools have relatively poor resolution because they measure casing properties averaged over areas a few inches across or larger.

The Schlumberger Cement Evaluation Tool (CET) and the Gearhart Pulse Echo Tool (PET) are closest to our "digital ultrasonic scanning tool" in capability. These are ultrasonic tools with eight transducers arranged 45 degrees apart around the circumference of the tool. The CET was originally designed to detect cement bond problems, but has been adapted to give casing thickness measurements (Dumont et al., 1984). The PET performs similar functions (Sheives et al, 1986). Both the CET and the PET determine thickness by exciting the fundamental casing resonance, while the DUST relies more on harmonics. The CET apparently uses a frequency domain method to determine the resonance frequency (Dumont et al., 1984; Havira, 1981), whereas the PET uses a fast time-domain processing algorithm (Sheives et al, 1986). The primary differences between the DUST and the CET or the PET are related to resolution.

The CET/PET transducers usually illuminate only a fraction of the total casing surface. Thus there is a good possibility of missing serious problems. The DUST will usually cover the entire surface and therefore has a much better chance of catching defects. The DUST provides a much more detailed image of the areal extent of defects. The tradeoff of course is that the DUST must be logged more slowly -- 5 ft/min is a good speed.

The precision of thickness measurements among the three tools is probably comparable. The minimum wall thickness measurable by the CET and the PET is about 0.2". The DUST with its higher frequency transducers can obtain thicknesses down to 0.1", and even lower with some modifications. The tradeoff here is that a smaller minimum wall thickness either reduces the ability to cope with attenuative muds and rough surfaces, or it requires much more signal processing time. The DUST is versatile enough to operate over a range of transducer frequencies, including those used in the CET and PET.

We have found that having the DUST confidence level for each thickness is a valuable interpretational aid which is worth the extra computational effort. Neither the CET or the PET has a similar feature to our knowledge.

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Summary and Conclusions

The ARCO "digital ultrasonic scanning tool", DUST, has been built specifically for detailed imaging of exterior corrosion of casing and tubing. The DUST employs a windowless rotating transducer and state-of-the-art electronic circuitry to produce, acquire and record ultrasonic echoes from casing. Digital signal processing techniques are used to extract wall thickness values. The thickness data and associated confidence values are displayed as gray-scale or pseudo-color images, or in polar plots.

The DUST offers better resolution than existing corrosion detection tools. Because it is slow running, it is probably best used for detailed inspection in areas that a faster survey tool has identified as having problems.

The DUST is highly versatile. It performs all the functions of the conventional BHTV. It can also be used for cement bond inspection in the same way as the CET and PET, given changes in transducers, and in software and firmware. It should be capable of very detailed televiewer-like imaging of cement-bond quality. With other modifications the DUST can be used in open-hole applications as well.

Acknowledgments

L. J. Smith helped greatly in both the design and testing of the tool. Y. Ohashi provided essential help with processing and display. Others who made important contributions to the tool development include E. Pasternack, E. Howell, D. Lafferty, J. Watson, L. Sauer, L. Patterson, W. Hetherington, S. Seale, K. Riggs, D. Wood, K. Whitlock, D. Hearn, and M. Batzle.

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AMOCO Exploration Company. Senior member of IEEE; Active member of SEG. Primary interests are his wife and two daughters.

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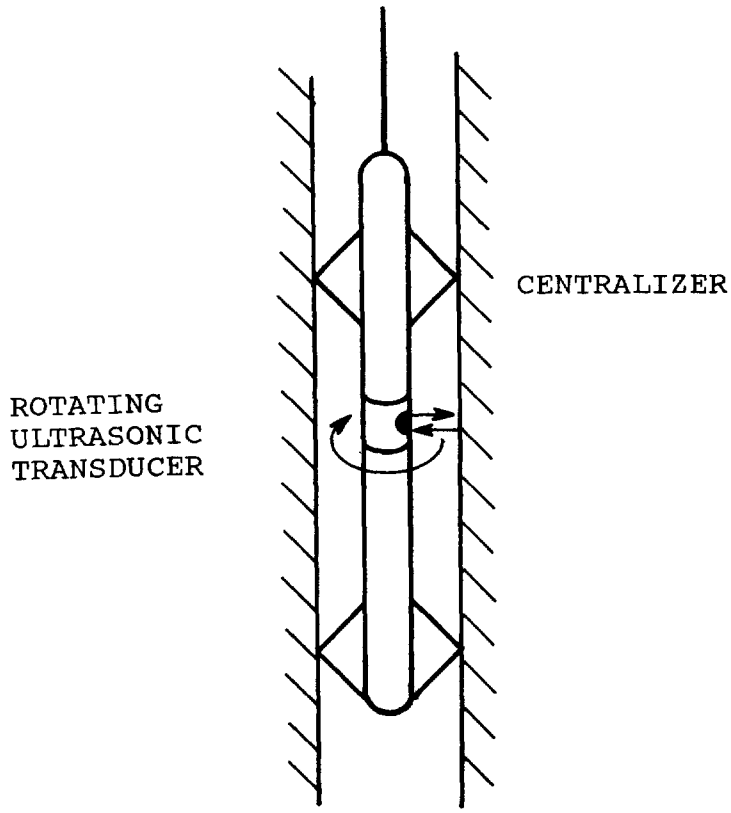

Figure 1. Borehole televiewer operational schematic.

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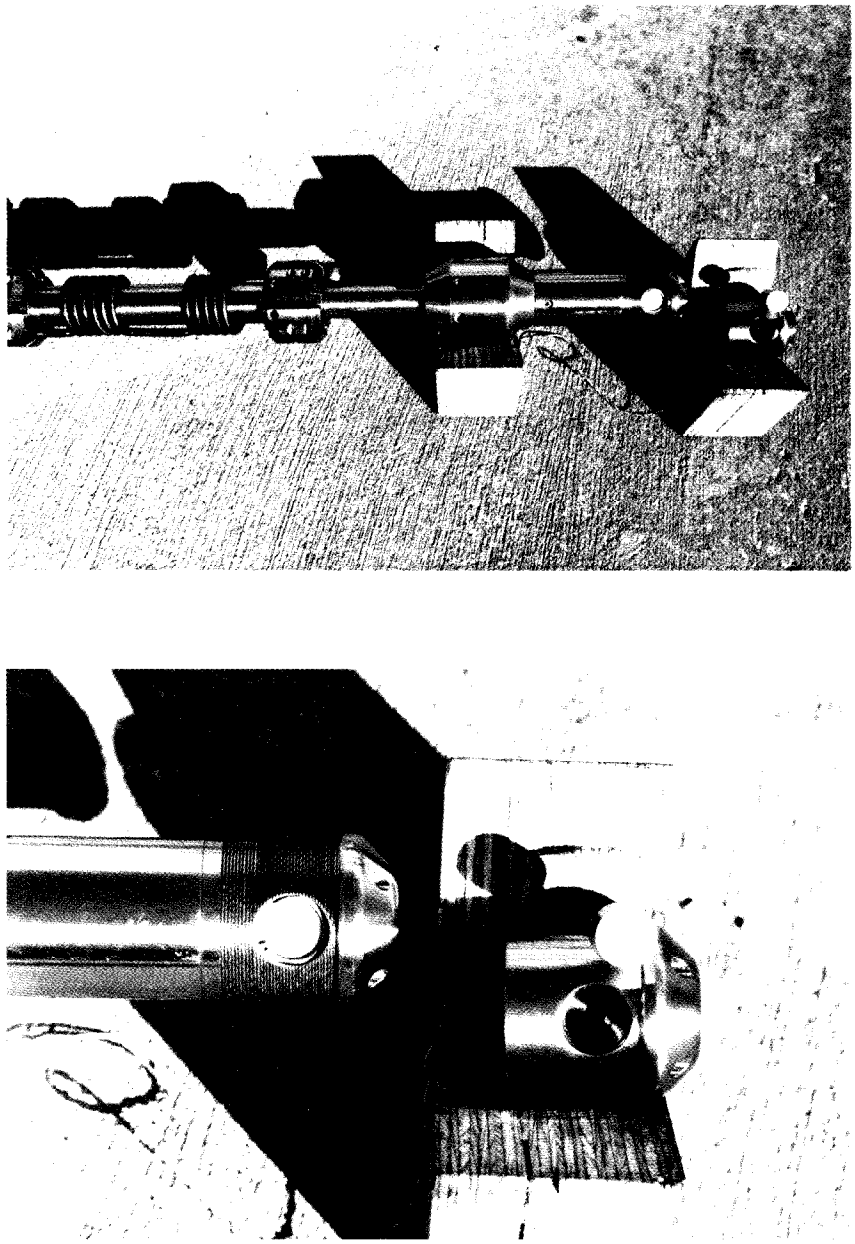

Figure 2. ARCO's Digital Ultrasonic Scanning Tool (DUST). The lowest two feet of the tool is shown at the top. The bottom centralizer with its roller arms removed is to the left. The rotating head is at the very end of the tool. A spare head with its transducer perched above it is shown to the right of the tool. A close up of the heads is at the bottom. The transducers are 0.75" in diameter.

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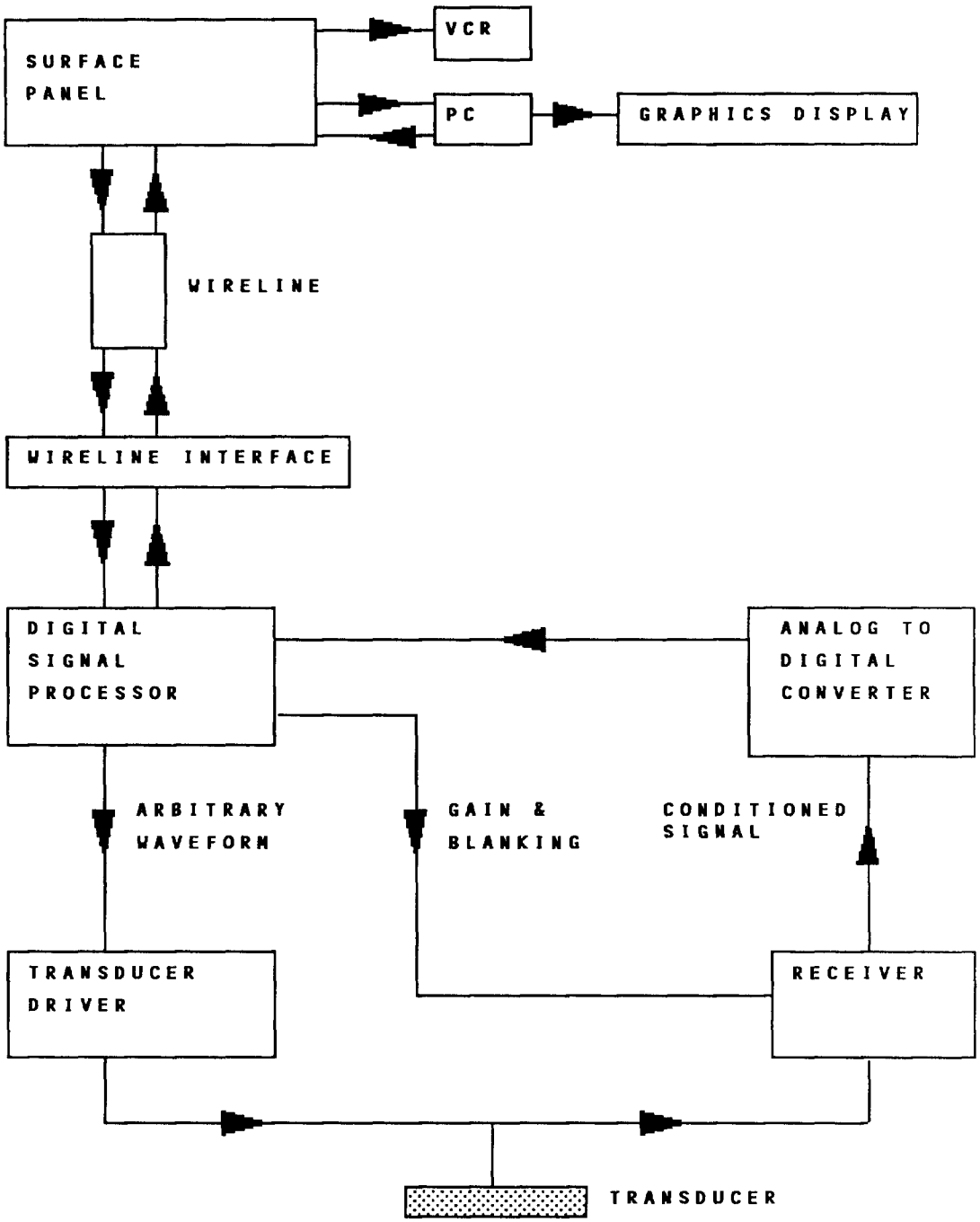

Figure 3. Schematic functional diagram of DUST electronics.

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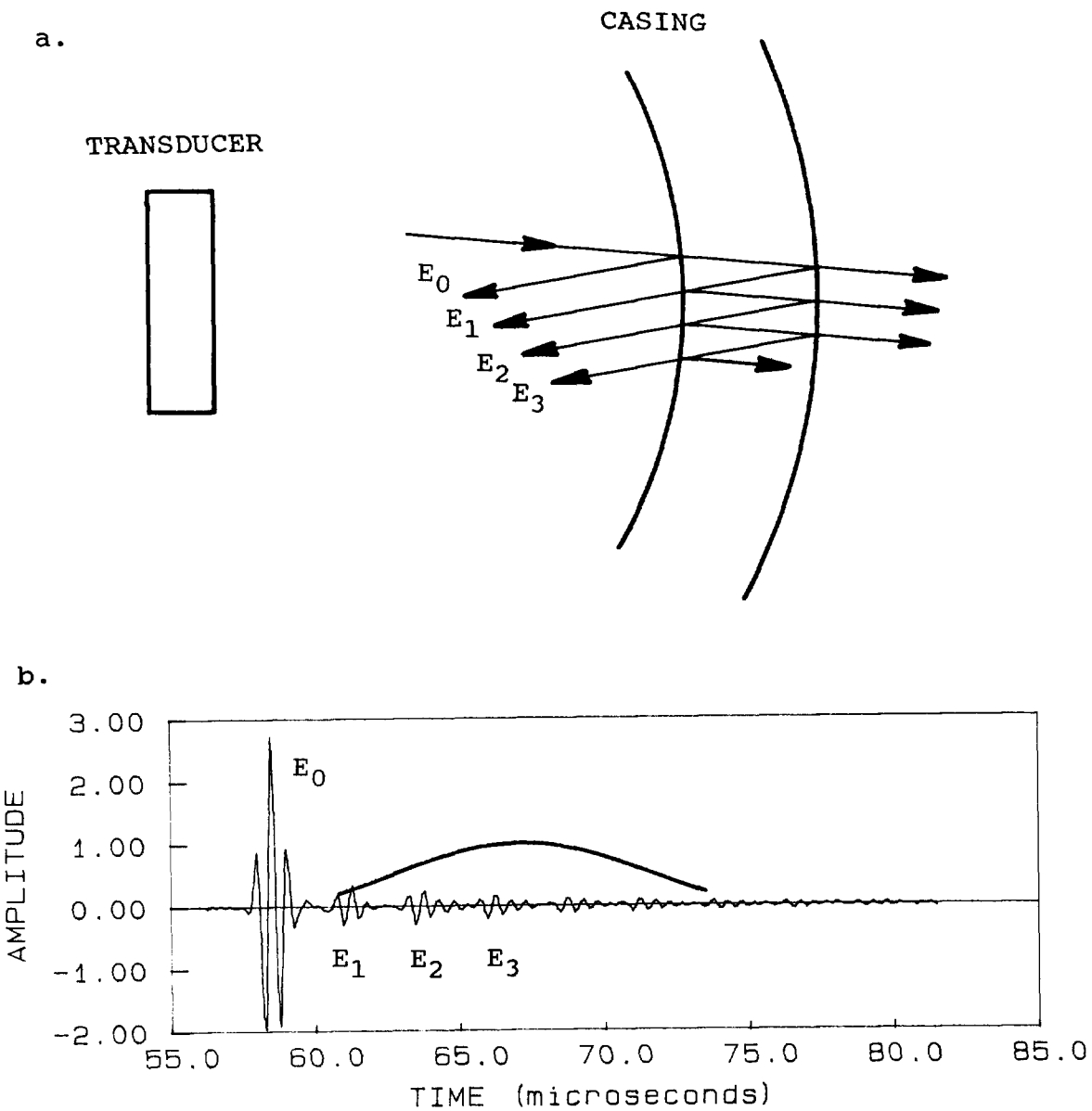

Figure 4. a. Ray diagram for ultrasonic echoes from casing. b. Actual experimental echo sequence from uncorroded pipe. The initial echo, E_0, and a portion of the reverberatory sequence, E_1, E_2, E_3,... are digitized and sent uphole. The heavy smooth curve above the trace indicates the part of the signal used for the thickness calculation, and the shape of the applied taper.

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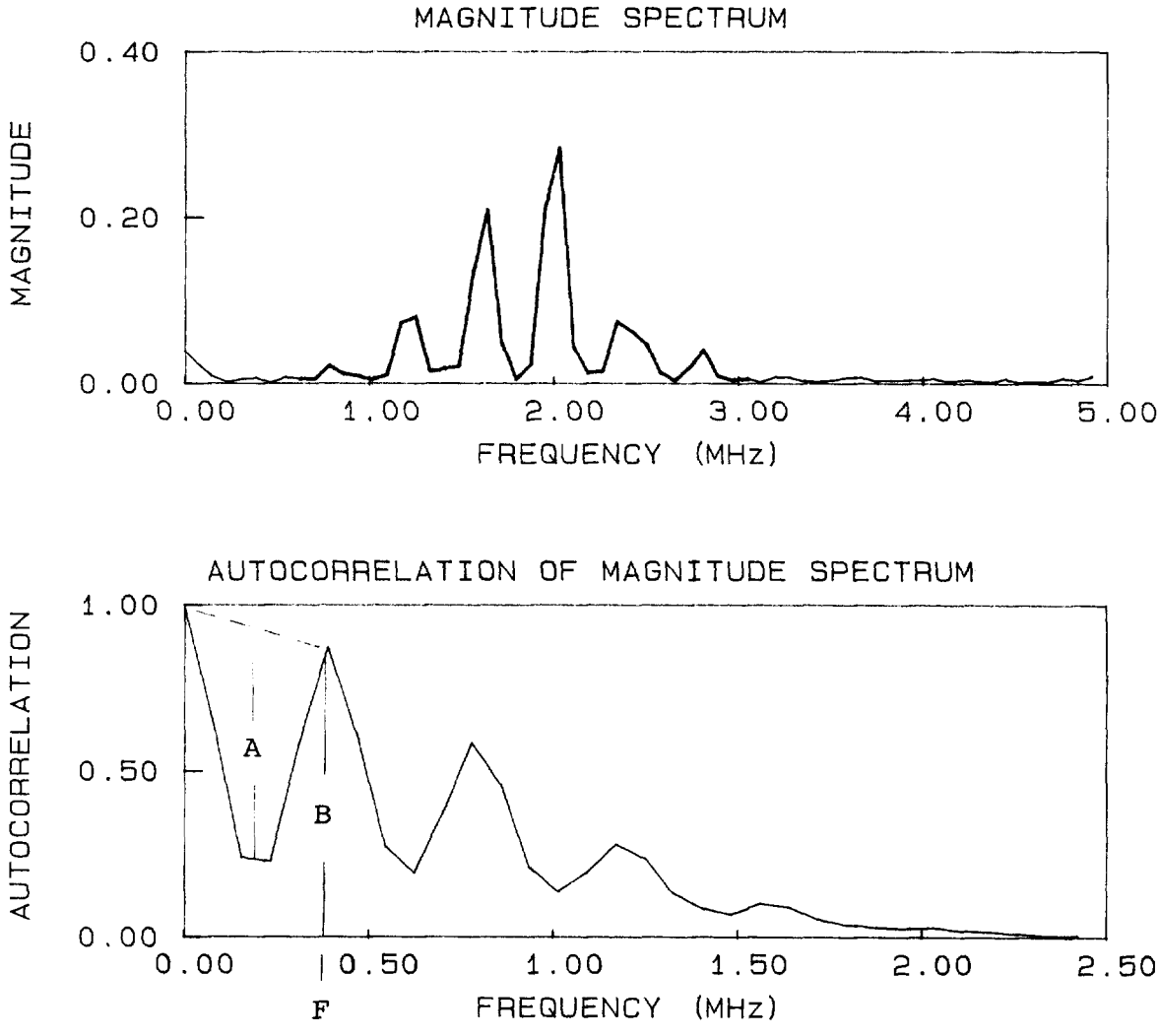

Figure 5. The magnitude spectrum and its autocorrelation for the signal of Figure 4b. Wall thickness is calculated from the position, F, of the first autocorrelation peak. The confidence level is the product of the peak height, B, and the valley depth, A.

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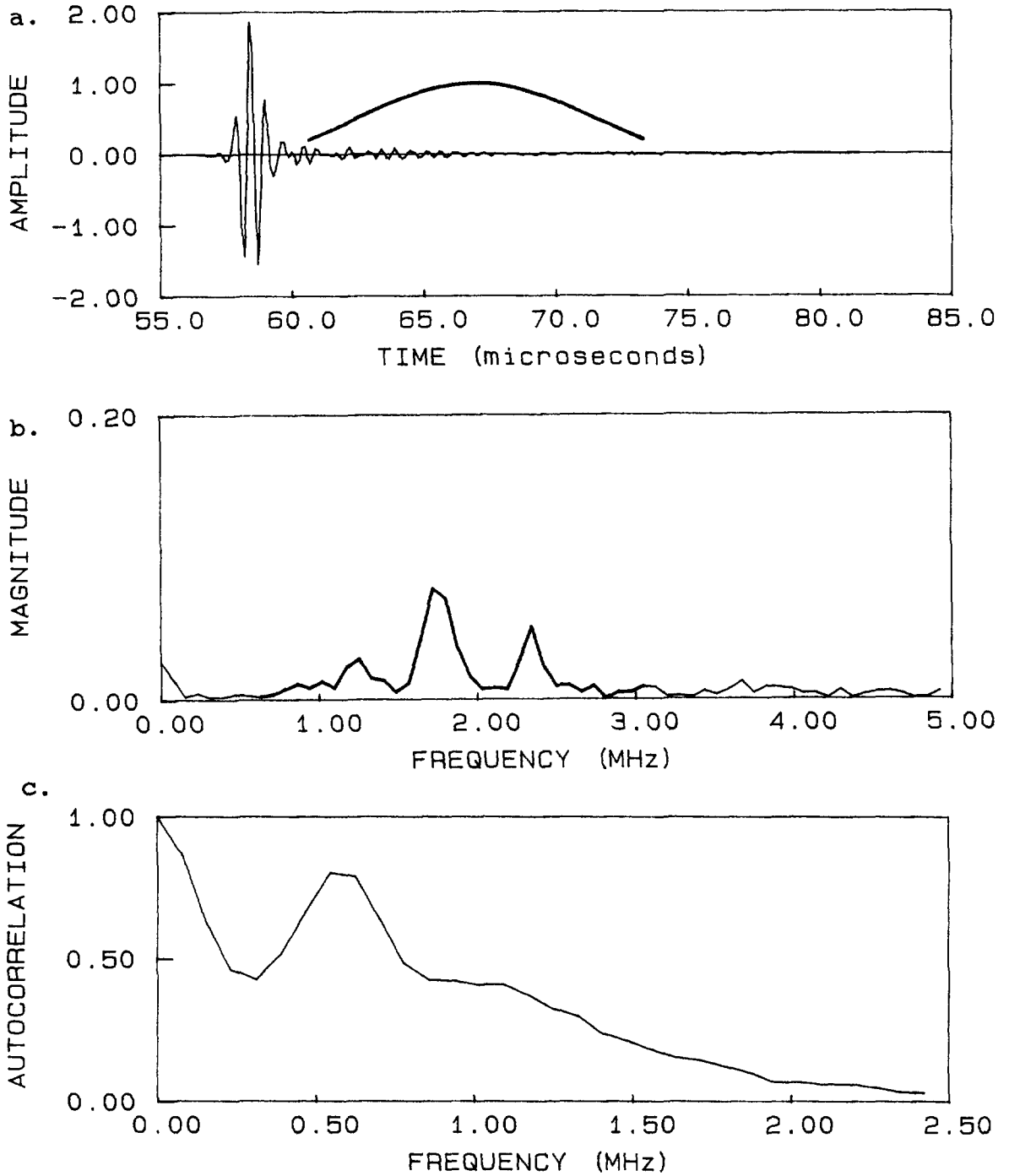

Figure 6. (a) Ultrasonic signal from casing corroded externally. (b) Magnitude spectrum showing resonance peaks farther apart than in Fig. 4. There are 3 distinct peaks well above noise level in the transducer band. (c) The autocorrelation of the magnitude spectrum has a well defined peak. The confidence level in this case was 3, which is the maximum on our scale of 0-3.

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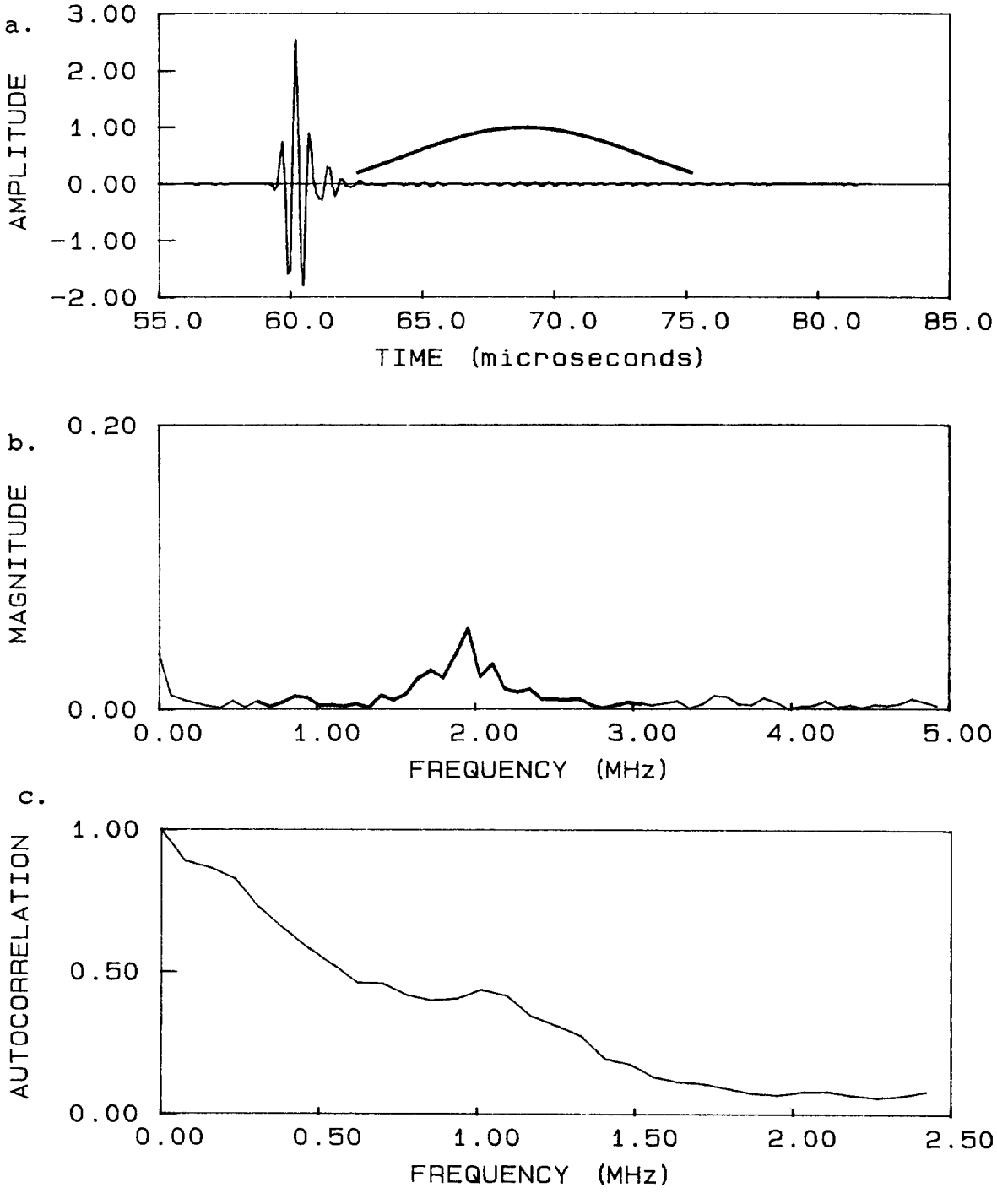

Figure 7. (a) Ultrasonic signal from casing corroded externally. (b) Magnitude spectrum with weak peak at 2 MHz and possibly another peak at 1 MHz down at noise level. (c) The autocorrelation of the magnitude spectrum has a weak peak at 1 MHz that may be due to casing reverberations. The confidence level in this case is 1 (again on a scale of 0-3).

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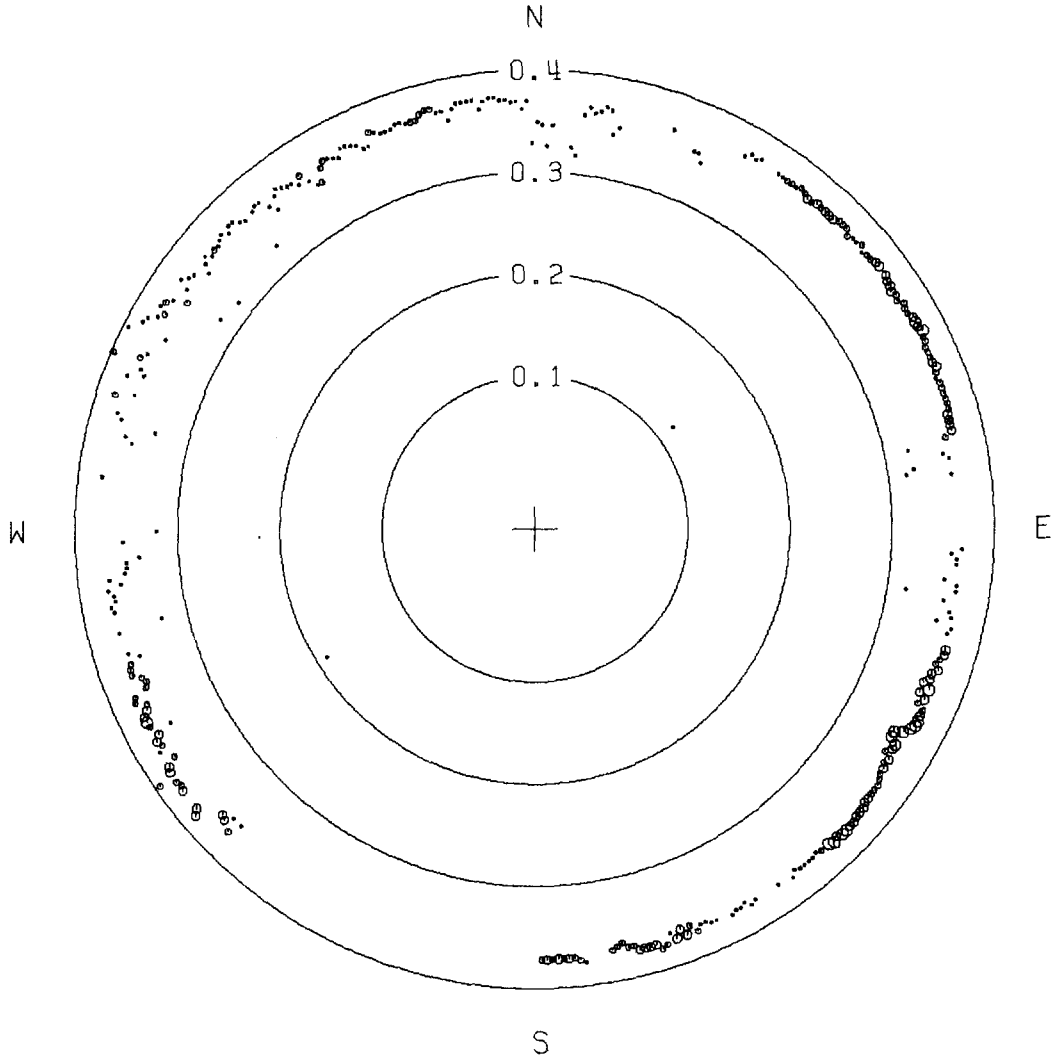

Figure 8. Polar plot of pipe wall thickness. The thickness is plotted as a linear function of radius. The true thickness measured with a calibrated high frequency ultrasonic thickness gauge is 0.362 in. The DUST thicknesses are shown as small open circles, and the confidence level is indicated by the size of the circle. Larger circles indicate higher confidence levels. There was no defect at this point on the pipe. The gap in the data at lower left is due to accidental erasure of a data file. Directions N, S, E, and W are shown only for reference.

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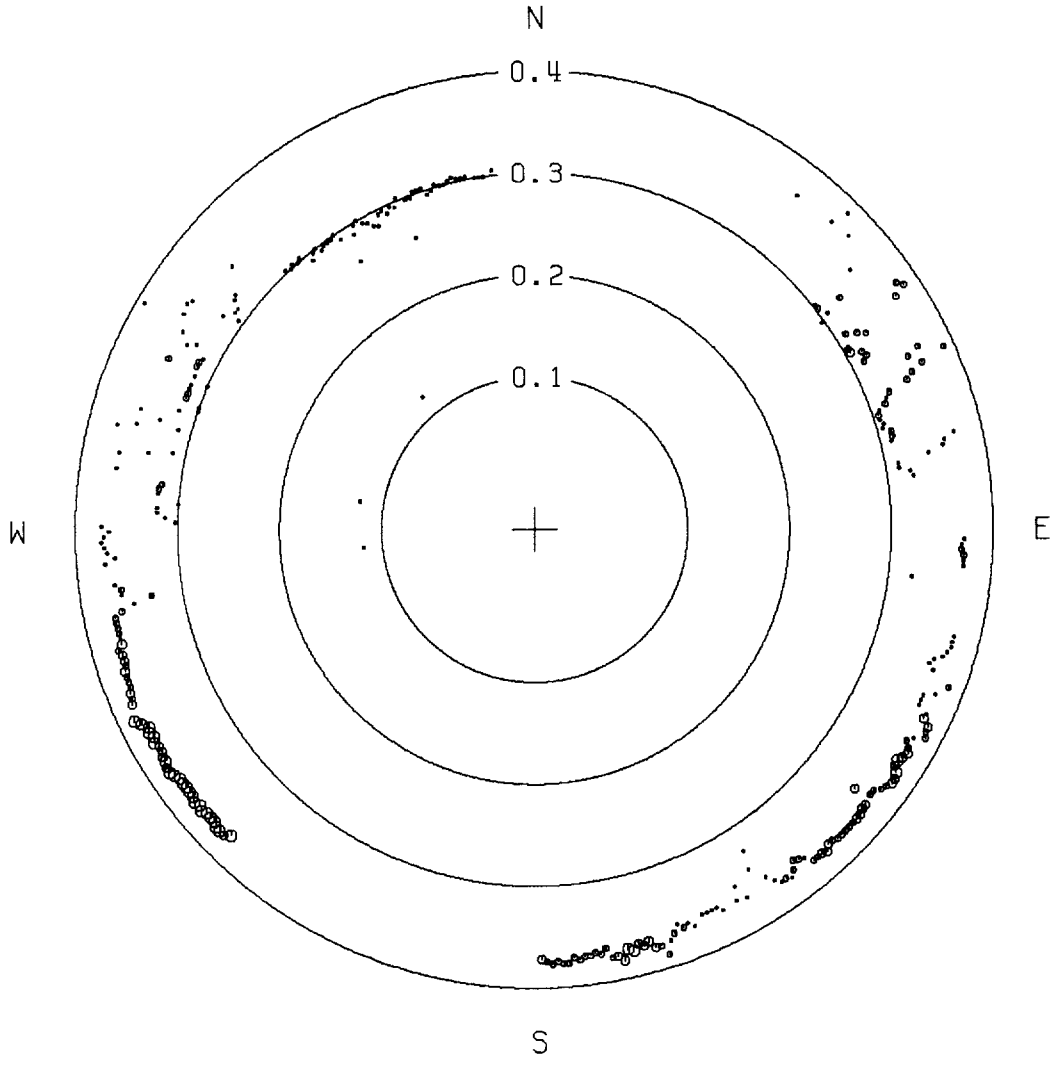

Figure 9. Polar plot of pipe wall thickness. The data is plotted as in Figure 8. Data points at the top of this figure come from points where the ultrasonic beam fell squarely on the groove. Elsewhere, the beam fell either on the unmachined pipe or on the edge of the groove. The true wall thicknesses were about 0.362 in. next to the groove, and 0.307 in. in the groove.

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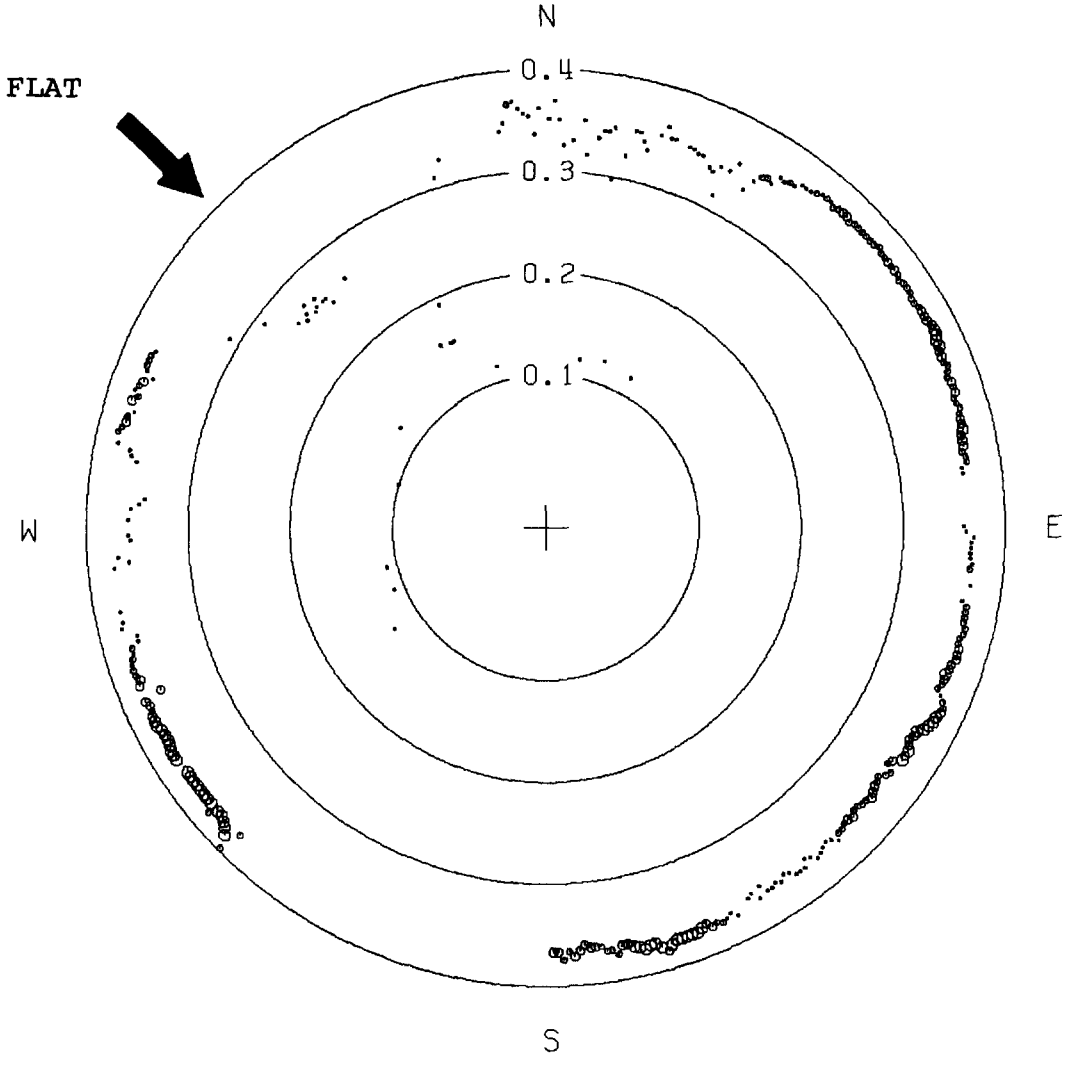

Figure 10. Polar plot of pipe wall thickness. The data is plotted as in Figure 8. The cluster of points at about 0.27 in. thickness at NW are from the center of a external flat machined on the pipe. The true minimum wall thickness was 0.271" at the center of the flat.

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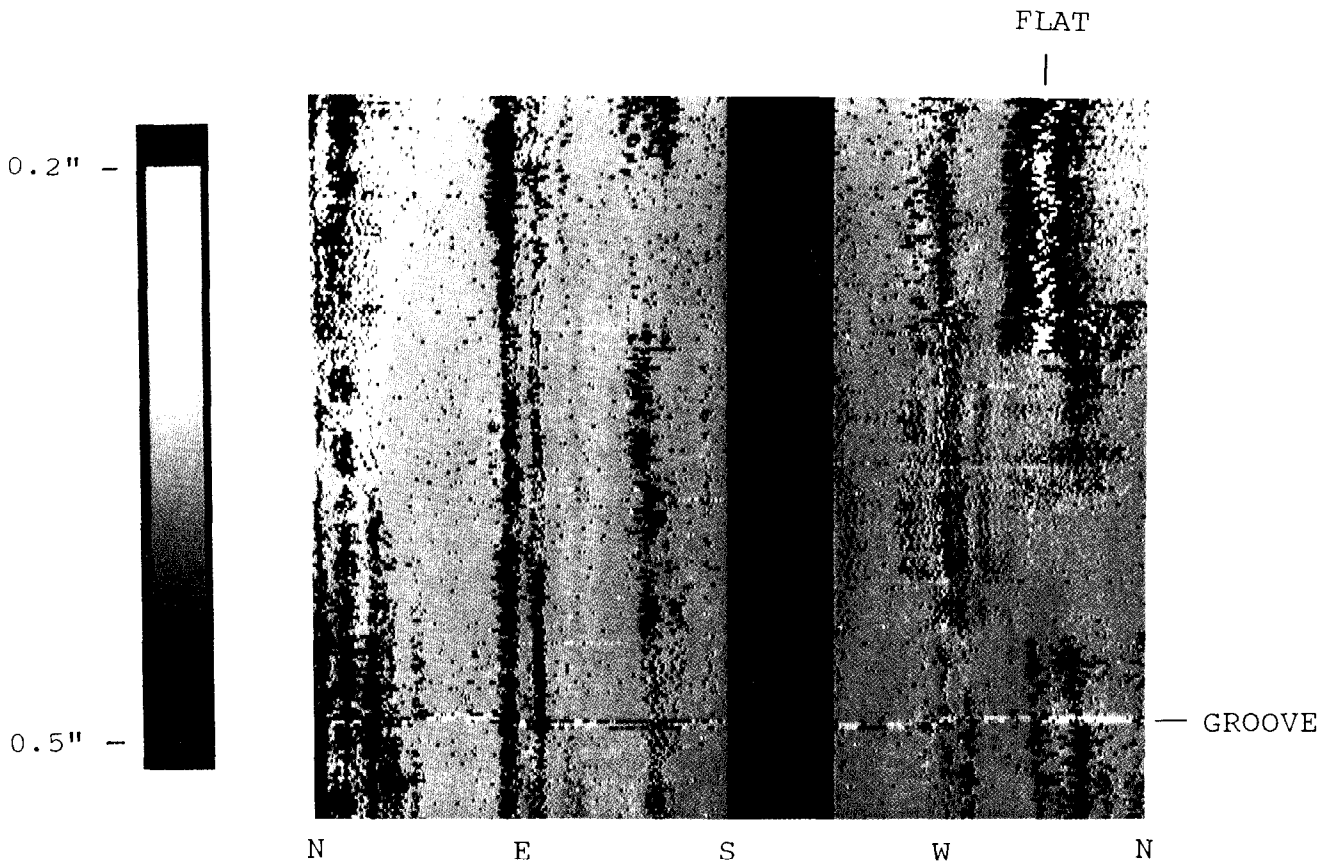

Figure 11. Gray-scale thickness image of pipe with machined external flat and groove. The image height corresponds to 5 feet of pipe, and its width corresponds to a circumference of about 15 inches. The gray scale is chosen so that dark points indicate thicker walls and brighter areas correspond to thinner walls. Black indicates that no valid thicknesses could be obtained from the data. The circumferential groove is near the bottom of the image. The external flat is at upper right. These are the same features shown in Figures 9 and 10. The black stripe through the image between S and SW is due to lost data.

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SPE 108698

Well Integrity Assurance: A Successful Method for External Corrosion and Damage Detection on Outer and Middle Concentric Strings of Casing

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Abstract

As well integrity is of utmost importance for personnel safety and environmental interests there is an ever increasing need for tools and systems that verify and confirm the status of wells with suspect integrity. Recent near-surface, outer casing failures caused by external corrosion on relatively new wells in the Kuparuk Field of Alaska prompted research for a non-invasive predictive method to foresee failure and aid repair prioritization. There are a variety of tools and methods available to locate leak points and corrosion inside of tubulars, but very little literature exists concerning external corrosion and damage detection on outer and middle concentric strings of casing. The following method is a valuable qualitative approach used to determine existence and severity of shallow external surface casing corrosion before leaks occur.

The technique uses a logging tool that analyzes the variations of metal thickness within three concentric sets of down-hole tubulars and identifies areas where metal loss exists. The metal loss combined with assumed or known internal tubing condition reveals the wells with the highest risk for shallow surface casing leaks. When a high risk area is discovered proactive excavation repair plans can be made before any safety or environmental problems occur. This paper summarizes the tool, technical approach and assumptions, limiting factors, and the remarkable comparison between the metal thickness logs and the actual external surface casing corrosion observed on 12 wells after excavating each up to 27 ft in the Greater Kuparuk Area. Future plans and strategy using the technique are also discussed in the paper.

Introduction

The Kuparuk field is located on the North Slope of Alaska, approximately 30 miles west of Prudhoe Bay **(Fig. 1).** The Greater Kuparuk Area (GKA) includes the Kuparuk reservoir as well as several other smaller oil pools in the operating unit. The majority of GKA wells are completed with a conductor casing (CC), a surface casing (SC), a production casing (PC) and tubing. However, about 5% of the 1100 wells in the GKA have a single casing design—only the CC, SC, and tubing are present **(Fig. 2)**.

Normally the SC functions as an element of a secondary or tertiary layer of protection between the reservoir and atmosphere. For single casing wells the surface casing is the primary and sometime only layer of protection if there is no packer. Therefore, a degradation of the surface casing resulting from corrosion is considered a serious breach of the integrity of a given well[1]. Prediction and mitigation of SC corrosion problems are considered vital steps to maintain the mechanical integrity of the wells, the safety of the personnel, and protection of the environment while maximizing the life of the wells.

Cause and Extent of Surface Casing Corrosion

Historical records, field investigation and lab results from a previous study (SPE Paper 100432) indicate the near surface casing corrosion is a result of cyclic or consistent moisture ingress of oxygenated water with the annulus between the SC and CC. Elevated well operating temperatures in conjunction with an extremely corrosive environment caused by the soluble salts that leach from the cement create a very aggressive corrosion environment[1].

Over the last few years, the aggressive corrosion environment has become increasingly evident as 38 GKA wells have been discovered with severe SC corrosion failures at shallow depths typically less than 30 ft. Most of these corrosion failures are on single casing produced water injection wells. They appear to have a higher failure rate than other GKA wells because they operate at warmer external casing temperatures than multi casing injectors or production wells.

To date, 22 of the 38 known failures have been visually inspected and repaired by a process which takes approximately four weeks to complete. In addition to the remaining wells currently waiting for repair, the failure rate is such that several new wells are added to the repair list every year. The driving factor behind running the thickness log was to develop a tool that can recognize and locate metal loss with enough accuracy that it can be used as a proactive tool to prioritize repairs before the corrosion becomes actual leak failures to the environment.

Tool Description

The tool is a memory tool, run on slick line and designed to investigate variations of metal thickness within concentric down hole tubulars. It is a centralized tool that generates an alternating magnetic wave which is propagated out of the tool and permeates the casing **(Fig. 3).** The wave velocity and amplitude is affected by the total thickness of the metal through which it has to travel. The wave is detected on the sensor array when it completes its path by reentering the wellbore. A sensor next to an area with metal loss receives the wave back quicker than a sensor next to an area with no metal loss. The differences are used to locate and quantify the variations of metal thickness in the tubulars.

Resulting from the concentric pipe strings in the log interval the data is qualitative—indicating an overall increase or decrease in metal surrounding the tool, but not distinguishing in which pipe string the metal thickness occurs. It has been noted, however, that sharp, high-frequency metal loss or gain responses appear to be limited to features of the inner-most pipe string logged. Features of second and third concentric strings usually appear as lower frequency (more spread out) responses. For our purposes we calibrated a base line near the bottom of each CC string making the assumption that all pipe strings at that depth had no damage. Most of the wells also had tubing caliper results that helped corroborate the assumption. Any metal thickness readings smaller than the baseline could be from any of the three strings of pipe, however any average metal loss over about 5% appeared to directly correlate with excavation results on most of the twelve wells showing external casing corrosion at the same depths.

Development, Operation, Data processing

The tool was originally developed as a quantitative wall thickness assessment tool for monobore applications. Where there is only one string of pipe with known API dimensions in the tool's inspection field, readings from the tool taken at three different transmission frequencies are used to calibrate the tool response to an absolute remaining wall thickness measurement. The tool's useable transmission frequency ranges from 8 Hz to 16 Hz. Higher frequencies provide for greater vertical detail of anomalies, but reduce the overall amount of metal that the signal can effectively travel through. Lower frequencies can effectively travel through higher metal volumes, but provide less detail of recorded anomalies. For applications involving three concentric strings, such as those at Kuparuk Field, the lower frequency spread of 8 Hz, 10 Hz, and 12 Hz provides for the best overall data quality.

During programming of the memory tool for deployment, the tool is set up to take three calibration readings at 8 Hz, 10 Hz and 12 Hz, each at a different stop spaced 10 ft apart. This is necessary to help assure that at least one of the sets of calibration readings will be at a point where there is no tubing or casing collar. The proximity of the tool to collars at the calibration points is confirmed by correlating these calibration depths to the full log pass, which clearly shows the location of collars relative to the calibration points. After taking calibration readings in each interval of different pipe configuration to be logged, at least one full dynamic log pass is made at 30 ft/min.

Recording the tool response for calibration at three different frequencies in an area assumed to represent undamaged pipe is necessary to calculate percent metal loss values from the raw recordings. After which, only a single full log pass is required to collect the rest of the data. In short interval applications (less than 500 ft log interval), three passes, each at a different frequency (8 Hz, 10 Hz and 12 Hz), are made to increase the confidence in assessment of recorded isolated events that could potentially be a response to sudden or erratic tool motion rather than a feature of the pipe. Assessment of the tool's response to the same feature at different recording frequencies can also help to discriminate the proximity of the feature to the tool. Features that are very prevalent in lower frequency passes, but significantly less prevalent in higher frequency passes are most likely features of the outer-most concentric string.

Logging Plan and Results

In an effort to obtain and refine a method to locate and categorize casing damage on the middle concentric string of casing before leaks occur, the metal thickness log was run on seven single casing wells (that have 3 concentric strings; CC, SC and tubing) with known SC leaks near surface that were scheduled for excavation and repair. The excavation and repair process presented the unique opportunity to compare the log results with actual visual damage. Even though the logs results give qualitative data they revealed the accurate location of the damage on surface casing and after visual comparisons of just a few wells we were able to quantify how significant that damage was in each well prior to excavation **(Fig. 4 – 7).**

Following the first round of data, the tool was run on five additional wells that did not have leaks, but were suspected to have some level of corrosion and were also proactively scheduled for excavation and inspection. Similar to the seven wells with leaks, the visual inspections vs. log comparisons from the five proactive excavations were also remarkably accurate. The logs not only provided a sense of corrosion severity before excavating, they also revealed exactly how deep the excavations needed to be to reach good metal below the damaged areas for patching.

The well type, tubular information, log results, caliper results (if run), and visual comparison data for all twelve excavated wells were summarized for development and use as a qualitative corollary tool **(Table 1).**

Subsequently the tool was run on all the injection wells with a single casing configuration in the GKA. Those results were compared to the visual correlations documented from the 12 previous excavations and used to categorize damage and prioritize the additional wells for proactive excavation, inspection, and repair. Excavations were not scheduled for the wells that exhibited minimal or no wall loss, however, the tool will be re run periodically to track corrosion rate.

Furthermore all the log results from a total of 25 single casing wells were analyzed and compared to evaluate the methodology, usefulness, and accuracy of the tool within a range of tubular sizes **(Table 2).** From that comparison, it was readily apparent that the logs were most confidently correlated with SC damage on wells with 16" CC x 5.5" SC x 3.5" tubing configurations. However, the primary reason for the high confidence factor is that more logs and comparison

excavations were completed on the wells with that 5.5" SC configuration. All of the wells that were excavated and have that specific casing configuration (16" CC x 5.5" SC x 3.5" tubing) and reported 5% or greater metal loss on the log results required SC repair.

The log results on 7-5/8" SC appear to show a good qualitative comparison. However, since only two 7-5/8" SC wells (each with a different tubing size) had been excavated and inspected at the time this paper was written, it was not possible to establish a percentage of metal loss that would correlate with the need for patching. More excavation and SC inspections need to be completed on the other tubular sizes to achieve the same high correlation confidence.

Also important to mention, but not covered in this study, is the metal thickness log results have had good success in locating and providing a sense of severity for a wide range of tubular configurations for external tubing or PC corrosion farther down hole.

Complicating Factors

Physical Issues - During the data processing phase and the log evaluation part of the study, some anomalies that were unexplained at the time, were discovered on a few wells. After closer inspection of each anomaly and the associated well, several physical issues were clearly identified that could skew results if not accounted for during the log evaluation.

Two wells that were logged had ESP's. The ESP power cable clearly shows up on one of the 12 data tracks as additional metal **(Fig. 8).** If the average metal thickness results on the log are the only part of data evaluated, it is possible that the additional metal thickness from the cable could skew the average metal thickness reading enough to make the results unreliable. This concern can be worked around by reviewing each track of data, as well as the combined average when evaluating the log.

Other physical issues that caused data distortion were identified and accounted for with surface inspections; for example, removal of CC cement circulation ports and standing boards **(Fig. 9 and 10).**

In addition to the known physical issues mentioned above, there is also an unknown element that can factor in. During data processing, an area near the bottom of the CC is chosen based on log response as a baseline and is assumed to have 100% metal thickness **(Fig. 11)**. The validity of this assumption is contingent on the overall condition of the tubulars—which is unknown, but can be surmised by log response. If the data is erratic because of issues discussed in the next section or if the tubulars are in poor condition through the entire interval choosing a baseline can prove difficult **(Fig. 12).**

Tool response is not only dependent upon wall thickness, but metal properties as well. It may respond differently to the same size and grade of pipe that is made at two different facilities, or maybe from two different batches of ore at the same facility. Therefore the baseline must come from the pipe that is being inspected rather than a documented nominal value.

Operational Issues - Since this is a memory tool the data cannot be viewed or validated while logging real time. There were a few instances where logging speed difficulties (which may not have been recognized during data collection) made the data interpretation difficult and in one case impossible. The sensor recordings as well as the line speed indicated that the tool was "jumping and stopping" at 2 to 3 ft intervals **(Fig. 13).** The phase shift values show regular flat spots separated by short intervals of significant signal variance. The flat spots represent the tool sitting still, and the short intervals of signal activity were recorded as the tool surged up to the next spot where it stopped again. Since the phase shift (the key signal interpreted) is dependent upon the travel time of a generated AC magnetic wave between the transmitter and receivers, the erratic motion of the tool during this log pass seriously compromised the ability to interpret these recordings.

The erratic tool motion should be evident real time on the wire line weight indicator as a continuous bobbing of the weight indicator needle during the logging pass. In the future, the activity of the weight indicator will be more closely monitored during the logging pass to determine the minimum pull speed that will eliminate the surging of the tool down hole.

Tool Limitations - As metal thicknesses surrounding the tool increase, more energy is required to transmit the AC magnetic wave through the material from the transmitter to the receivers. At some point, the volume of metal can become too high for the transmitted signal to reach the receivers in a useable form. This condition has been noted in all applications involving log intervals with four concentric pipe strings of any size and some log intervals with three concentric strings of larger pipe sizes. In the Kuparuk field applications, good results were achieved in log intervals with 16" CC x 5.5" SC x 3.5" tubing (cumulative weight of 87.4 lb/ft) and in intervals with 16" CC x 7.625" SC x 3.5" tubing (cumulative weight of 101.5 lb/ft). The tool response in the latter of these two configurations clearly showed some signal degradation in the form of higher signal noise, but overall tool responses appears normal to what is expected.

Log intervals with slightly larger pipe configurations, including 16" CC x 8.625" SC x 3.5" tubing (cumulative weight of 107.8 lb/ft) and 16" CC x 9.625" SC x 4.5" tubing (cumulative weight of 115.1 lb/ft) provide a readable and repeatable tool response, but exhibit an unexpected anomaly. At these total metal volumes, the tool's response to the SC collars and the bottom of the CC become inverted—indicating less metal at SC collars and indicating a lower volume of metal as the tool enters the bottom of the CC interval **(Fig. 14).** In the same intervals, the tool's response to the closer tubing collars is normal—indicating more metal at the tubing collars. It is theorized that under these conditions, the phase shift data is inverted due to the timing delay of the signal from the transmitter becoming so large that it misses the intended time-sync window at the receiver and is picked up early (indicating less metal) in the next (wrong) time-sync window. At this time, the tool's response to areas of potential corrosive metal loss to outer concentric strings under these logging conditions cannot be confidently interpreted.

Future Proactive Use

Current plans include running this tool yearly on all high risk and single casing wells at GKA and continue to correlate visual inspection data with log results to achieve a high correlation confidence on additional casing configurations.

Conclusions

- Qualitative Log results matched visual inspection remarkably well and gave a sense of the severity and location of the SC corrosion on the middle concentric string of casing before excavations were executed.
- The logs also enabled appropriate prioritization of near surface excavation and repair work to remedy the worst damage first.
- The log results provide an effective proactive tool to monitor and track wall loss and corrosion rates when repeated on a periodic basis.
- There are other down hole monitoring uses for the tool that were not covered in this study.

Acknowledgements

The authors thank the management of ConocoPhillips Alaska, Inc., BP Exploration (Alaska) Inc., and the other Unit Owners for permission to publish this paper. This paper reflects the views of the authors and does not necessarily reflect the views of ConocoPhillips or other Working Interest Owners. The authors wish to acknowledge the contributions of the ConocoPhillips Alaska Drilling & Wells Group and the ProActive Diagnostic Services Staff.

Nomenclature

CC = Conductor casing
ESP= Electric Submersible Pump
GKA = Greater Kuparuk Area
PC = Production Casing
SC= Surface Casing

References

1. Dethlefs, J. et al.: "Near Surface External Casing Corrosion in Alaska; Cause and Mitigation," paper SPE 100432 presented at the 2006 SPE Western Regional/AAPG Pacific Section/GSA Cordilleran Section Joint Meeting held in Anchorage, Alaska, 8-10 May 2006.

Tables

Well Information						Log Results			
Well	Reason	TYPE	SC (in.)	CC (in.)	Tubing (in.)	COMMENTS / STATUS	Patch Repair status	Caliper Data	Log vs Visual Correlation
A	Failed	INJ	5.5	16	3.5	8% metal loss from 18-26'	Done	shallow pitting pits up to ~2 % metal loss	Excellent
B	Failed	INJ	5.5	16	3.5	13% metal loss from 3.5-12' 15% metal loss from 18-29'	Done	pits w/ 6% metal loss at 32'	Excellent
C	Failed	INJ	5.5	16	3.5	12% metal loss from 4-8'	Done	shallow pitting up to ~2 % metal loss	Excellent
D	Failed	INJ	5.5	16	3.5	8% metal loss from 4'-10'	Done	no data near surface	Excellent
E	Failed	INJ	5.5	16	3.5	7% metal loss from 4-10'	Done	shallow pitting pits ~2 -5% % metal loss	Excellent
F	Failed	INJ	5.5	16	3.5	7% metal loss at 7' 6% metal loss from 10-20' may be tubing damage	Done	shallow pitting up to 4% metal loss	Excellent
G	Failed	INJ	5.5	16	3.5	8% metal loss from 3-10' 13-15% metal loss from 20-40' - some loss may be tubing wall	Done	shallow pitting 2-6% metal loss	Excellent
H	Proactive	Gas Lift	7.625	16	2.875	2% metal loss from 10-12' Noisy - hard to interpret - may be the 7 5/8" x 2 7/8" combo	Not needed	none	Good
I	Proactive	Jet Pump	7.625	16	3.5	16% metal loss from 0-3' metal loss my be exaggerated by larger size casing or tubing corrosion is also present	Done	none	Good
J	Proactive	INJ	5.5	16	3.5	5% metal loss at 1'	Done	shallow pitting up to ~3% metal loss	Good
K	Proactive	INJ	5.5	13.375	3.5	8% metal loss from 0-2' some wall loss may be tubing	Not needed	shallow pitting up to 4% metal loss	Poor
L	Proactive	INJ	5.5	16	3.5	15% metal loss at 4' Results really hard to read Possible line speed issues	Done	shallow pitting up to ~2 % metal loss	Poor

Table 1. Summarized Logging and Inspection Results

Casing Configurations			Well Statistics		
CC (in.)	SC (in.)	Tubing (in.)	Logs Run	Visually inspected	Correlation confidence
16	8.625	3.5	1		NA
16	7.625	2.875	1	1	Not yet
16	7.625	4.5	4		NA
16	7.625	3.5	2	1	Not yet
16	5.5	3.5	16	9	Yes
13.375	5.5	3.5	1	1	Not yet

Table 2. Correlation Confidence by Pipe Size

Figures

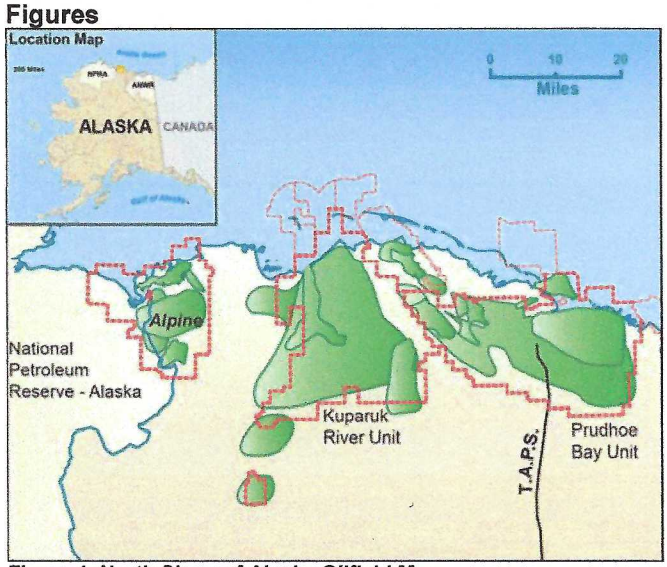

Figure 1. North Slope of Alaska Oilfield Map.

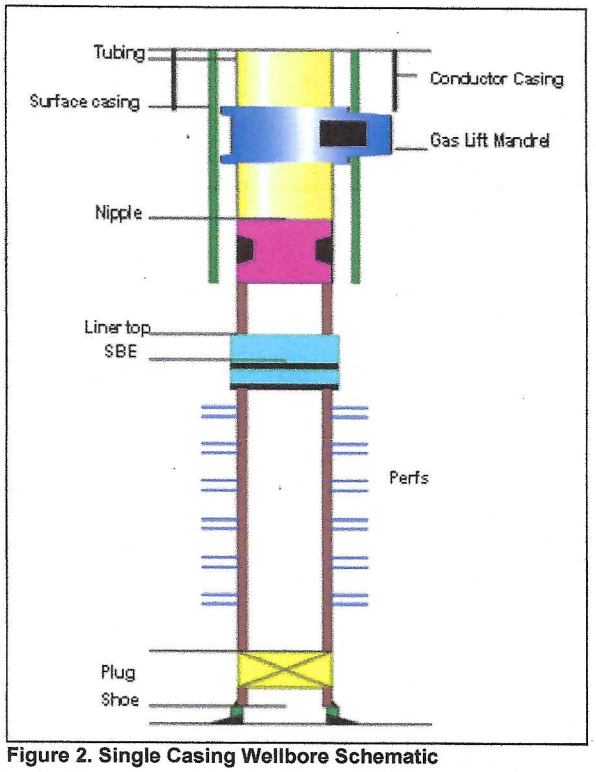

Figure 2. Single Casing Wellbore Schematic

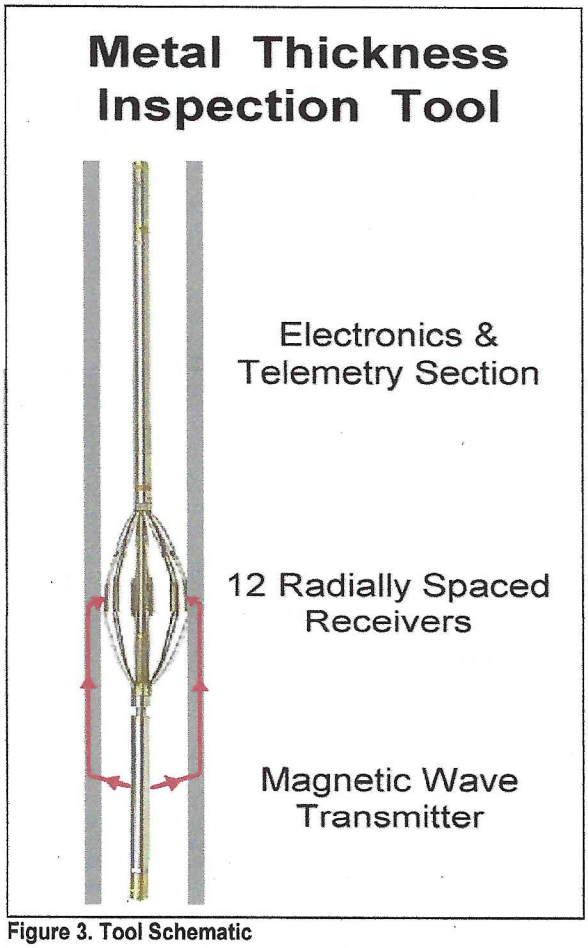

Figure 3. Tool Schematic

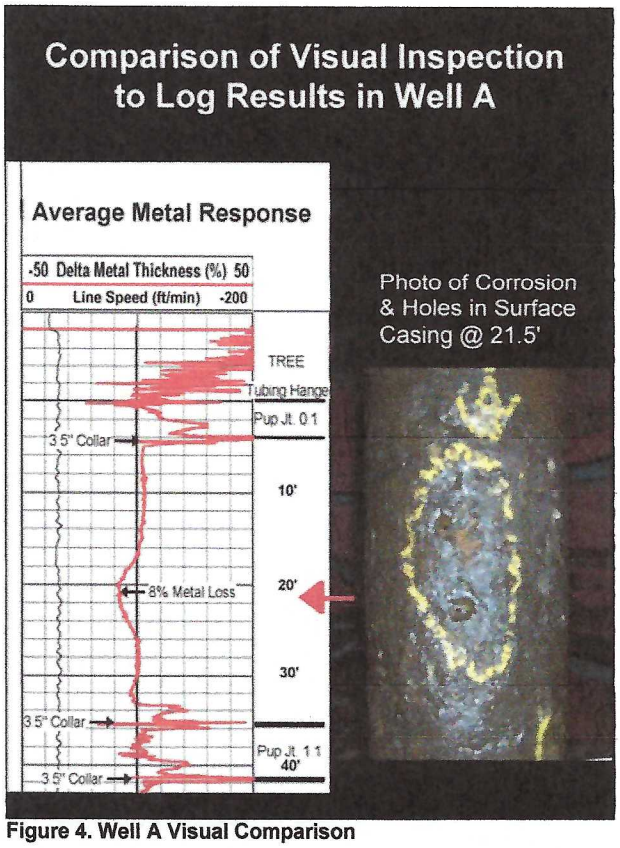

Figure 4. Well A Visual Comparison

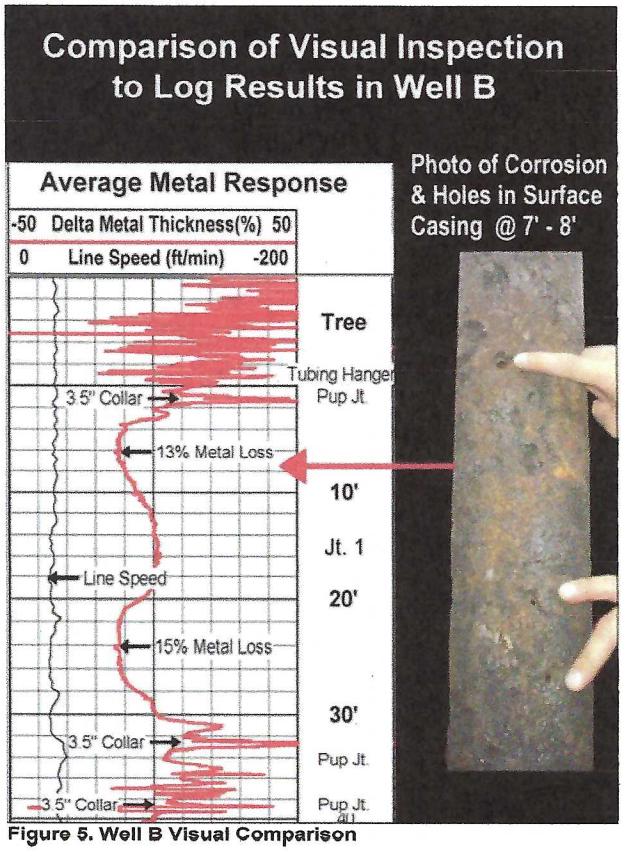

Figure 5. Well B Visual Comparison

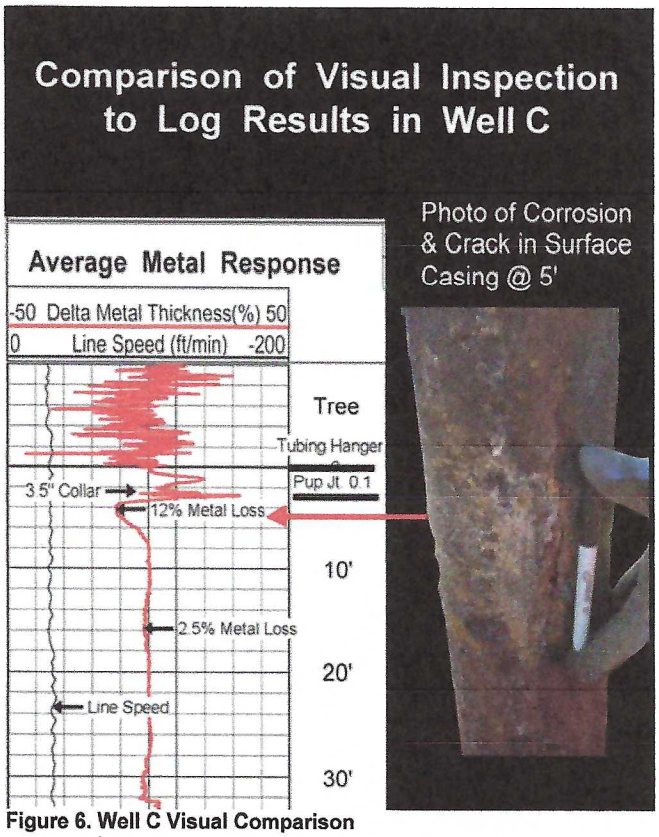

Figure 6. Well C Visual Comparison

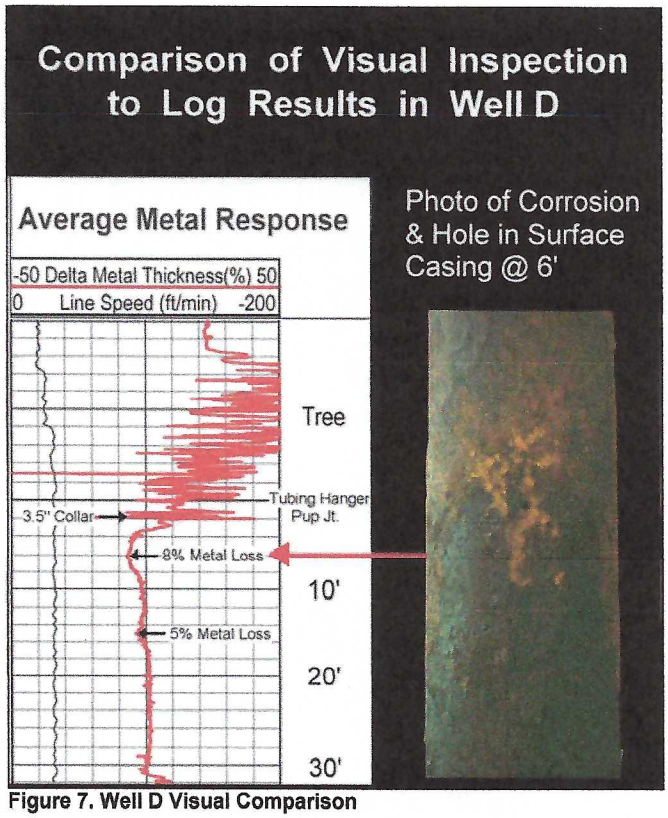

Figure 7. Well D Visual Comparison

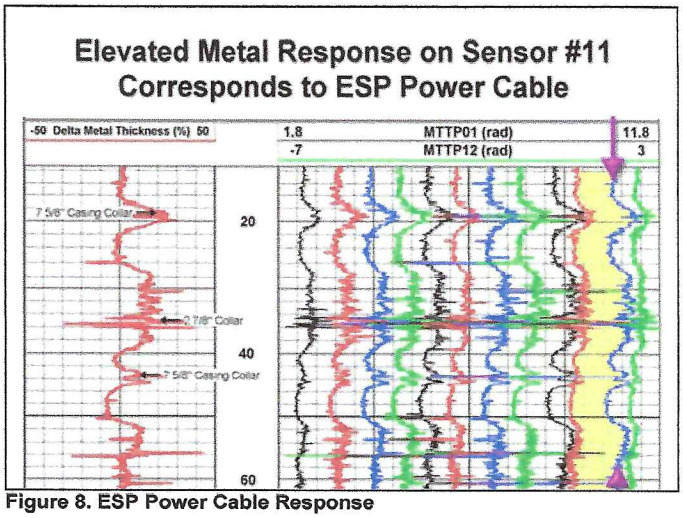

Figure 8. ESP Power Cable Response

Figure 9. Removed CC cement Circ Port

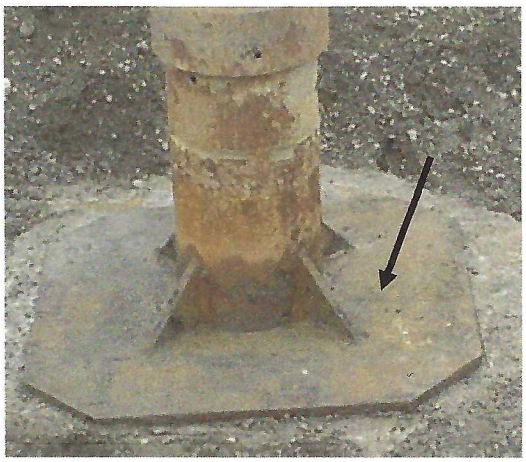

Figure 10. Standing Plate Discovered during Excavation

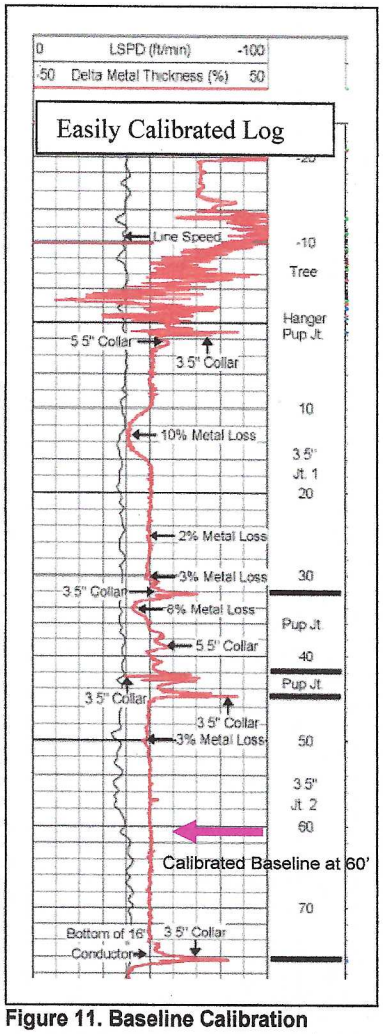

Figure 11. Baseline Calibration

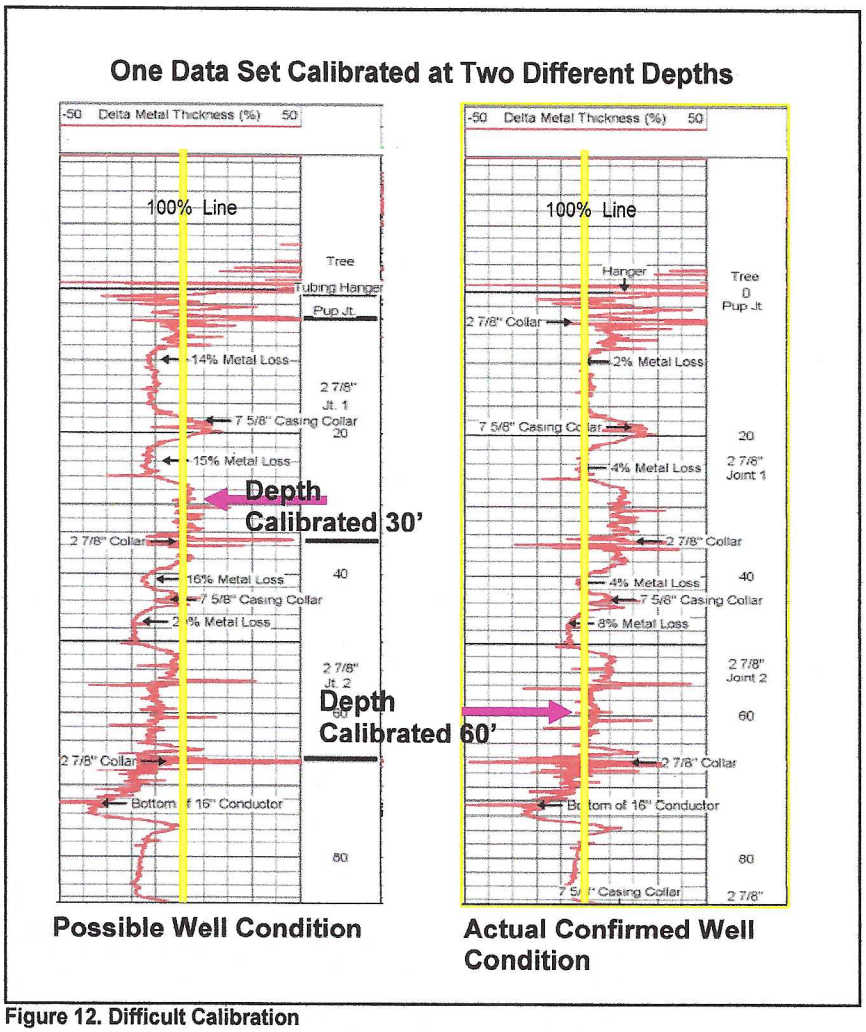

Figure 12. Difficult Calibration

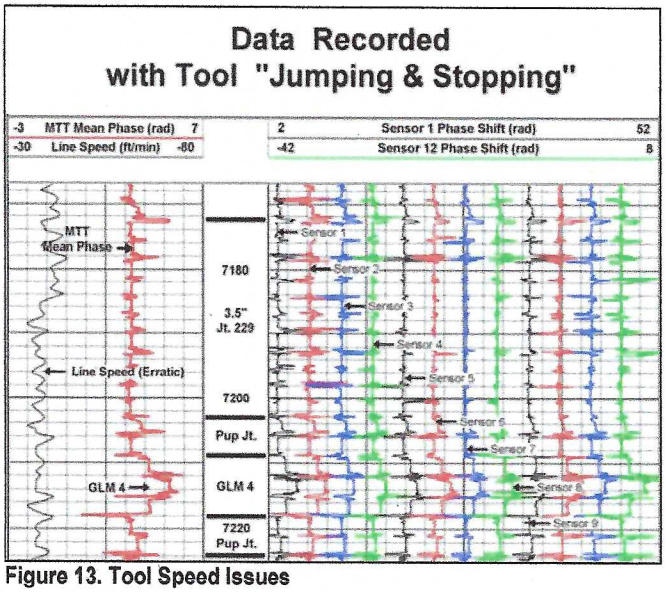

Figure 13. Tool Speed Issues

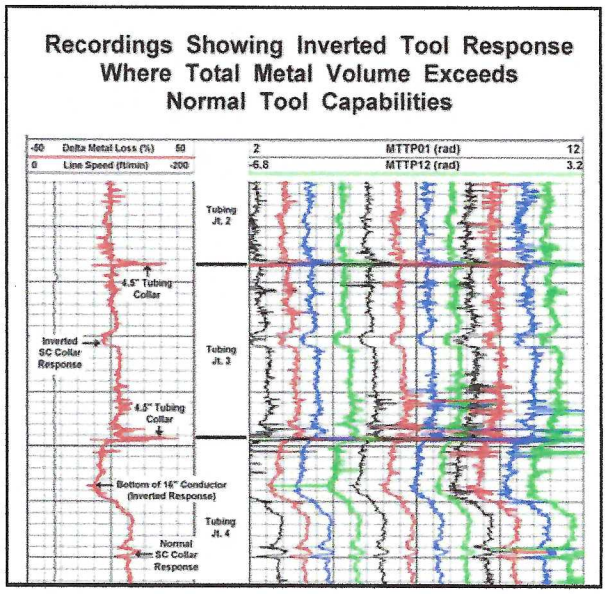

Figure 14. Tool Inverted Tool Response

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Locating and Repairing Casing Leaks With Tubing in Place—Ultrasonic Logging and Pressure-Activated Sealant Methods

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Abstract

When operators are faced with issues involving casing leaks, a typical course of action is to pull the tubing and make efforts to identify and locate the source of the leak by logging or other mechanical means. If the leak source can be successfully located, a mechanical method is generally employed to patch the leaking casing. This methodology is time consuming and expensive.

Locating casing leaks with the tubing in place using conventional logging techniques has historically been difficult. Where some tools, such as temperature tools, may provide an indication of an anomaly in annuli, the data may be subjective or the leak may be too small to measure. When active, a leak will produce a spectrum of sonic frequencies that may be either audible, ultrasonic or both. Ultrasonic energy will pass through steel but travels relatively short distances. A tool developed around these principles has been successful in accurately locating casing leaks behind tubing.

Pressure-activated sealants have been used for a number of years to cure a wide variety of leaks in casing, tubing, control lines, and well heads as well as micro-annulus leaks in cement. For the purpose of repairing a casing leak behind tubing, the liquid sealant may be pumped into the annulus and displaced to the leak site. The liquid sealant will not polymerize until it is exposed to the differential pressure through the leak site. Knowing the leak rate, pressure and precise location of the leak aids in the selection of the sealant formulation and deployment method. This helps to reduce overall repair cost as well as increase the probability of a successful repair.

This paper will describe the ultrasonic method of leak detection and the method of curing leaks with pressure activated sealant with tubing in place. Case histories will be presented where these methods were employed to repair casing leaks without removing the tubing.

Introduction

Perhaps the most challenging well integrity issue with which operators deal with today are casing leaks. Not only are the methods to repair these types of leaks without pulling the tubing limited, but the detection of these leaks using conventional logging methods with the production tubing in place is practically impossible. A common diagnostic methodology is to rely on some fairly subjective logging data and pressure responses to determine where a pressure barrier is leaking. Following this, cement is pumped down the annulus or through punched tubing in an attempt to seal off the leak. This process, along with other hardening sealant methods, can be problematic. Additionally, using this method will also make other operations or future workovers difficult or impractical.

Pressure activated sealants have been used on numerous occasions to repair casing leaks with the tubing in place. A major advantage in utilizing this technology is that the sealant will only solidify where the leak is active. In addition, the material is easily removed by mechanical means and will not add difficulty to future workover operations if required.

As is true with other remediation methods, a complete understanding of the leak source is critical when planning a pressure activated sealant operation. This is especially true when dealing with leaks behind the tubing. Optimal sealant formulations may be selected along with deployment methods for maximum affect. While rate and differential can be determined by pressure and well bore data, a leak behind casing is more complex. Detection of casing leaks is difficult using conventional logging techniques. These leaks will produce no reading on spinners (for obvious reasons) and may not produce temperature changes that are of a magnitude to confirm a leak point. This is true even with fairly large leaks (>1gpm). Conventional noise logs can detect fluid or gas movement, but must be used in a stationary mode and distant noise sources may confuse interpretation. Tracer logs may be used but can also produce imprecise results.

The ultrasonic leak detection method has been proven to be useful in detecting leaks behind casing with a high degree of accuracy. This suggests that it would be a useful tool in evaluating wells for repair using a pressure activated sealant method where accurate spotting of the treatment is critical.

Ultrasonic Leak Detection Method[1]

The following section briefly discusses how a leak produces an ultrasonic signature and the method of locating leaks with a passive ultrasonic logging tool.

Ultrasound Production by Leaks

The properties of a leak determine if it will produce an ultrasonic signature, an audible signature, or both. The factors involved in producing an ultrasonic signature are related to leak rate, differential pressure across the leak, leak path geometry, and the corresponding media. The presence of turbulent flow at a leak point has been determined to produce an ultrasonic signature. Ultrasound, like audible sound, will pass through steel, gas, liquid, and other media. Although attenuation is present in these media, it is typically small enough to allow ultrasound detection by equipment available today.

Ultrasonic Sensor

Piezoelectric crystal sensing devices have been used for a number of years in many applications. For this tool, a sensor was utilized that detects a spectrum of frequencies including those typically produced by leaks. The sensor used is capable of detecting the sound generated by a leak through various media encountered in a down hole environment.

Digital Signal Processing

The piezoelectric sensor produces small voltage responses proportional to the signal strength produced by the sound generated at the leak point. In order to isolate the frequencies of interest, the small piezoelectric analog signal is amplified and passed through a digital signal processing unit within the tool. The processing unit is equipped with a large amount of flash RAM (random access memory) running a series of modular signal processing programs. The programs consist of a series of band-pass algorithms that focus on the ultrasonic frequencies that are typically produced by leaks. The filtering algorithms remove unwanted background energies caused by mechanical noise or other interference. Virtually all audible frequencies are filtered out. The result is a fully digitized signal of the leak signature which is then transmitted up-hole via a conventional electric line telemetry system to a surface read out system, producing a graphical representation of the leak signature. The tool may also be deployed on slick line, coiled tubing, or by other methods requiring memory data storage.

Tool Response

The graphical representation of the tool response shows three frequency windows of investigation (**Fig. 1**). Three traces used are the total energy level, a medium-high frequency range, and a very high frequency range (ALD A, B and C, traces respectively). These are unitless measurements of signal strength. A casing collar locator (CCL) is also presented for correlation purposes.

The leak signature shown in Figure 1 is a tubing leak in a water injection well with a magnitude of approximately 0.08 gpm with a differential pressure across the leak of 900-1200 psi.

Pressure Activated Sealant

Pressure Activated Sealants have been successfully used to perform a variety of repairs in oilfield equipment. Both oil-based and water-based sealants are employed depending on the system conditions. By adjusting the specific gravity and viscosity of the sealant, methods and procedures may be developed which precisely place the sealant at the previously determined leak site. Once placed, manipulation of the pressure differential across the leak site then activates the sealant to complete the repair.

The sealant only activates at the point of pressure differential, converting to a +- 80 durometer elastomer within the leak path. Excess sealant not exposed to pressure differential (e.g. the sealant remaining in the annulus) remains in the fluid state. This fluid can be left as part of the annular fluid system, or can be flushed from the system if the annulus is required for other uses such as gas lift.

The sealants are custom blended for each repair; therefore precise pre-job diagnostics are important to ensure that the sealant blend and procedure is correct to ensure optimum results.

Case Histories – North Slope, Alaska

Avoiding a rig work over can represent a considerable savings to any operator. This is particularly true on the North Slope where work over operations involving pulling of production tubing can cost between one and three million dollars depending upon the complexity of the operation. This section will cite two specific case histories were leaks were detected behind the tubing and cured with the tubing in place.

Casing Leak Behind Tubing (Well A)

Ultrasonic Leak Detection. Well A (**Fig. 2**) is an active water and gas injection well completed with 3.5" tubing inside 7" casing. The "A" annulus failed a mechanical integrity test and the well was shut in due to loss of a barrier.

During logging operations, a mechanical integrity test was emulated by maintaining the "A" annulus pressure between 3300 and 2800 psi. A calculated leak rate was established between 0.21 and 0.39 gpm. A typical leak signature was located at 2574' measured depth (MD) during a dynamic pass of 30 ft/min, (**Fig. 3**).

In order to further confirm the leak location while logging, stationary readings are taken through an interval above and below the leak point (**Fig. 4**). The center scale, as with all stationary logs presented, has units of time in seconds. The depths are annotated. The tool was positioned at 2' intervals above and below the leak to verify the leak location. Note the change in signal strength over these intervals demonstrating the resolution of the tool.

When the tool is placed precisely at the leak point and the annular pressure is manipulated (by bleeding or pressuring up the annulus), the change in signal strength can be observed associated with the leak magnitude (**Fig. 5**). This measurement, along with the tubing and annulus pressure response monitoring, confirm in which barrier the leak is located. As the pressure is decreased in the annulus, it can be seen that the signal strength diminishes. As the pressure is increased, the signal strength increases.

Upon further analysis of drilling records, it was determined that the leak signature was in close proximity with a casing collar behind the tubing. The ultrasonic log results, combined with historic data, created a clear picture of the leak location and probable damage mechanism.

Pressure Activated Sealant Deployment. Once the location and characteristics of the leak location was identified,

repair options could be reviewed. Within the history of pressure activated sealants, thread leaks typically have a much higher chance of long term success than leaks caused by corrosion (high surface area, low cross-sectional area). Therefore the knowledge that the leak was most likely in a casing collar increased the confidence level in a pressure activated sealant repair.

To perform the repair, a water based sealant weighing approximately 8.5 ppg was selected. In order to accurately place the sealant across the leak, a delivery "platform" was created using brine heavier than the sealant, approximately 9.6 ppg. A plug was set in the tubing below a gas lift mandrel at 6665' and the gas lift dummy was pulled to expose a circulation path between the tubing and annulus. The 9.6 ppg brine was then circulated until the annular fluids were fully displaced with brine.

A 3 bbl pill of 8.5 ppg pressure activated sealant was injected into the annulus (equivalent to approximately 120' in 7" x 3 ½" annulus). The sealant was displaced to the leak site down the annulus using 80 bbls of diesel (6.8 ppg) while returns were taken from the tubing. The bottom of the sealant was spotted at approximately 2550', 24 feet above the leak site. Tubing returns were closed and additional diesel was pumped into the annulus in order to increase the squeeze pressure to 3000 psi. Annulus brine was squeezed through the leak until the sealant arrived at the leak site and started the activation process.

Over the space of 18 hours the pressure drop through the leak decreased from 130 psi/hour to 30 psi/hour. At that point the gas lift dummy was reinstalled and the well was returned to active water injection. The well subsequently passed a 2800 psi Annular Mechanical Integrity Test (MIT), with no pressure bleed off noted over 24 hours. The annular pressure was then reduced to 800 psi and the well returned to normal water injection service. The annulus pressure was then maintained at a minimum of 300 psi in order to provide a positive pressure differential from A annulus to the formation and hold the elastomer at the leak site

Casing Leak Behind Tubing (Well B)

Ultrasonic Leak Detection. Well B (**Fig. 6**) is also an active water injection well completed with 3.5" tubing inside 7" casing. The well was shut-in due to a loss of barrier indicated from a failed Mechanical Integrity Test.

During logging operations, the leak was established by maintaining the "A" annulus pressure between 2500 and 2000 psi. using diesel. The leak rate established ranged from 0.44 and 0.83 gpm. A leak signature was located at 3060' measured depth (MD) during a dynamic pass of 30 ft/min, (**Fig. 7**).

The leak location was confirmed by stationary readings and manipulating the leak rate (**Figs. 8 & 9**).

A correlation of the leak depth with the casing tally indicated that the leak was in close proximity to a cement stage collar installed in the casing string. After location and analysis of the leak, the well was scheduled for application of pressure activated sealant to cure the leak.

Pressure Activated Sealant Deployment. As mentioned in the previous case history, an accurate knowledge of the leak location and characteristics provided confidence in the selection of pressure activated sealants as the best repair option. A similar procedure as the previous example was employed. A 3 bbl pill of 8.5 ppg pressure activated sealant was "floated" on 9.6 ppg brine and displaced to the leak location with 70 bbls of diesel. Then 1.8 bbls of diesel was used to pressure the annulus to 3000 psi. The initial annulus pressure drop was 1300 psi in 30 minutes. After 4 hours of maintaining annulus pressure at 3000 psi the sealant reached the leak location and the pressure drop fell to 200 psi in 30 minutes.

After an additional 8 hours of sealant cure time the dummy was replaced in the gas lift mandrel and the annulus pressure reduced to the required test pressure of 2000 psi. The pressure was monitored over the next 24 hours with no bleed off noted, indicating a successful annulus MIT. At this point the annulus pressure was reduced to 800 psi and the well was returned to normal water injection service. As in the previous example, the A annulus pressure was kept at 300 psi or higher to maintain a positive differential from the A annulus to the formation. The annulus pressure history during the repair is shown in Figure 10.

Conclusions

- Ultrasonic leak detection has proven to be effective in locating small leaks in the casing behind tubing.
- Pressure activated sealant is an effective alternative in the repair of casing connection or jewelry leaks.
- Knowledge of the leak location and characteristics provided confidence in the selection of pressure activated sealants as the preferred repair mechanism, and allowed an efficient repair procedure to be developed.
- The combination of these processes provided the Operator with a leak repair which restored the annular mechanical integrity at a fraction of the cost of conventional rig repair.

Acknowledgements

The authors thank the management of ConocoPhillips Alaska, Inc., and other Unit working interest owners for permission to publish this paper. This paper reflects the views of the authors, and does not necessarily reflect the views of the authors' respective Companies or other working interest owners.

Nomenclature

ft.	= Feet
in.	= Inch
MD	= Measured Depth
psi	= Pounds (f) per Square Inch
MI	=Miscible Injectant
MIT	=Mechanical Integrity Test
gpm	=gallons per minute
CCL	=Casing Collar Locator
GLM	=Gas Lift Mandrel
Ppg	=Pounds per Gallon

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2. Rusch, D., Ellis, B., "Use of Pressure Activated Sealants to Cure Sources of Casing Pressure," SPE paper 55996-MS presented at the SPE Western Regional Meeting, Anchorage, Alaska U.S.A. 1999.
3. Gutierrez, D., "BP's Deepwater Intervention Techniques for Maintaining Integrity in Subsea Wells", presented at Subsea Rio Conference, Rio De Janeiro, Brazil, 2004.

SI Metric Conversion Factors

Bbl x 1.590	E - 01 =	m^3
Ft x 3.048	E - 01 =	m
in. x 2.54	E + 00 =	cm
Lbf x 4.448 222	E + 00 =	N
Psi x 6.894 757	E - 03 =	Mpa

Figures

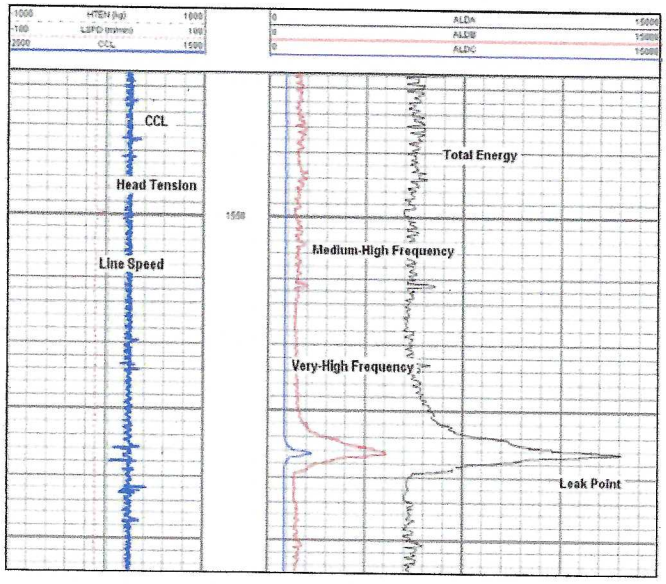


Figure 1: Graphical representing the tool response of the ultrasonic leak detection tool. This illustration demonstrates the frequency response of the tool as it is passed by a leak at typical logging speeds.

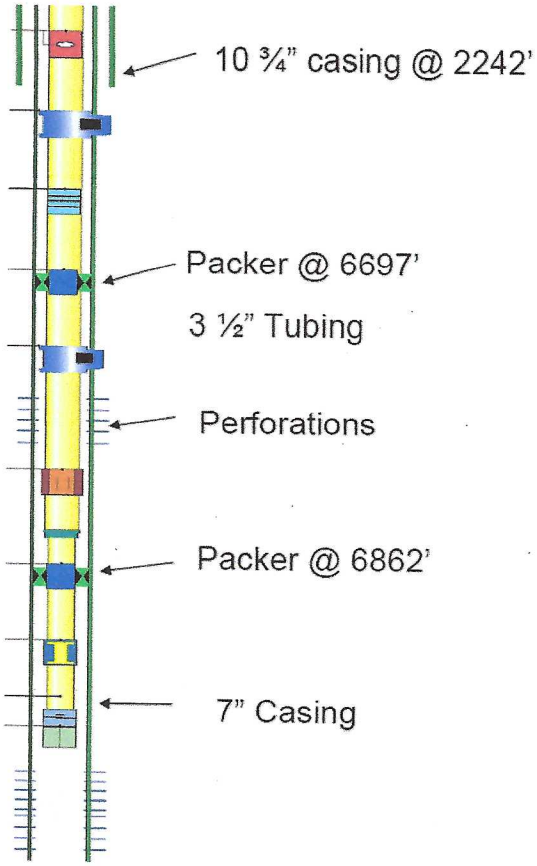


Figure 2: Schematic of Well A.

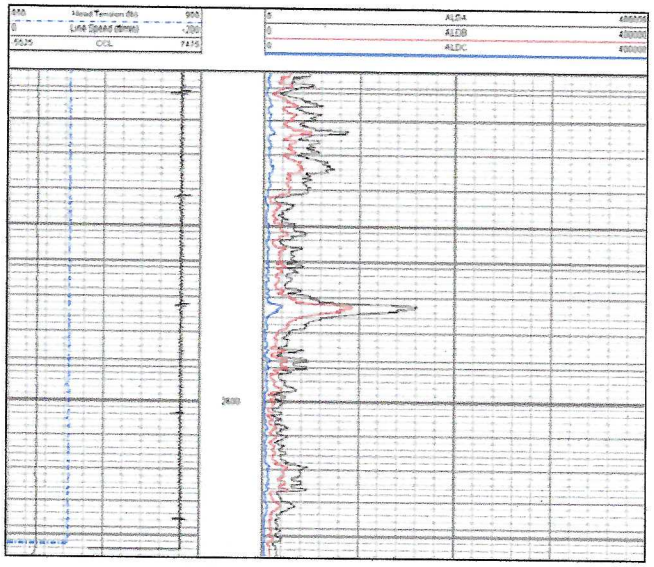


Figure 3: Well A Dynamic log showing casing leak at 2574' measured depth.

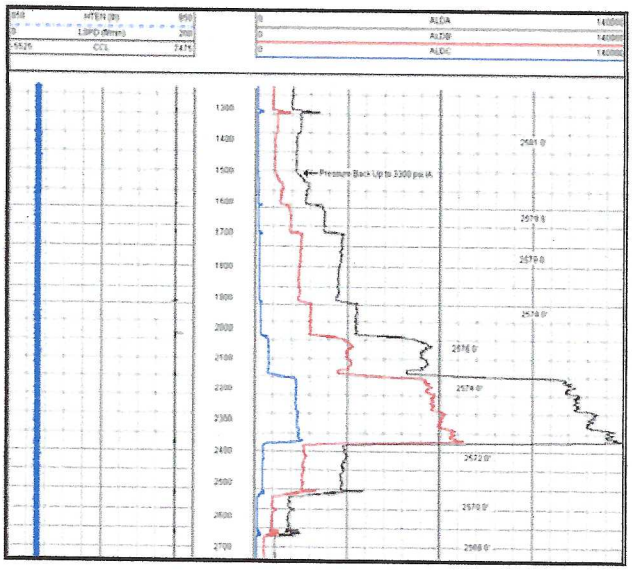


Figure 4: Signal response while taking stationary logs on Well A. Maximum signal strength is shown at 2574'.

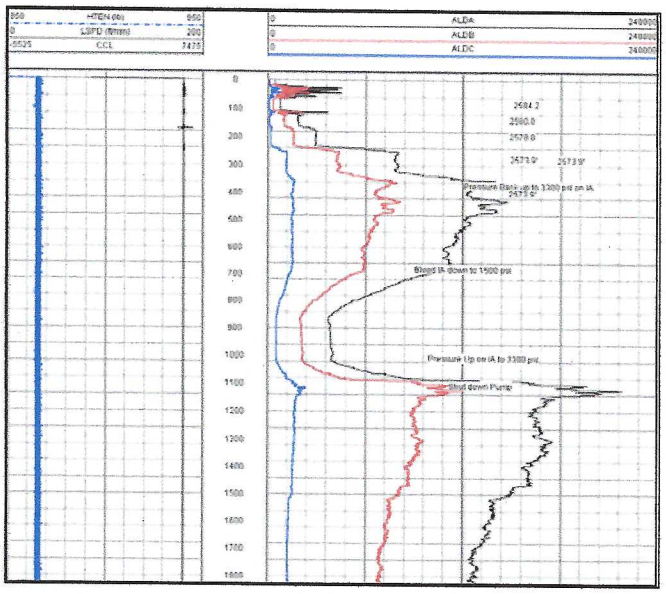


Figure 5: Well A stationary log showing response in signal strength as the pressure is manipulated.

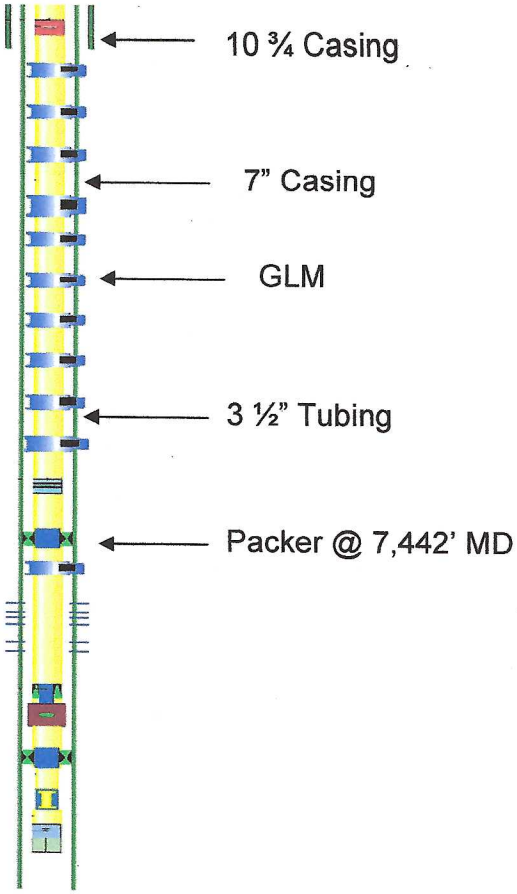


Figure 6: Schematic of Well B.

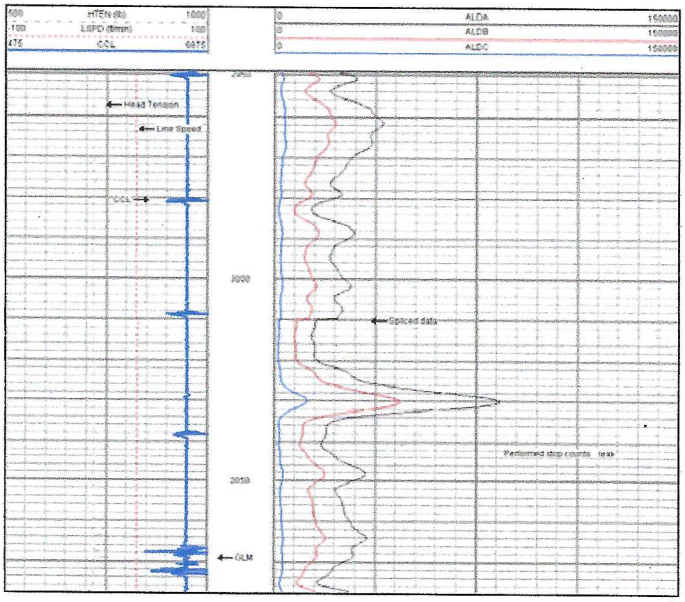


Figure 7: Dynamic log of tubing in Well B with leak at 3,030' MD.

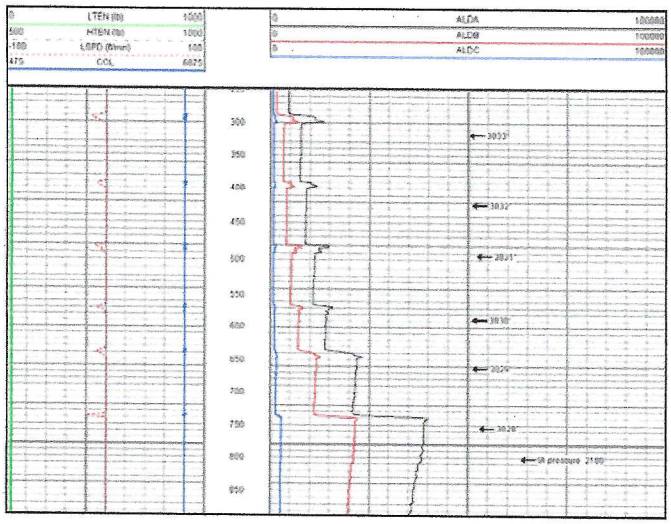


Figure 8: Signal response while taking stationary logs on Well B.

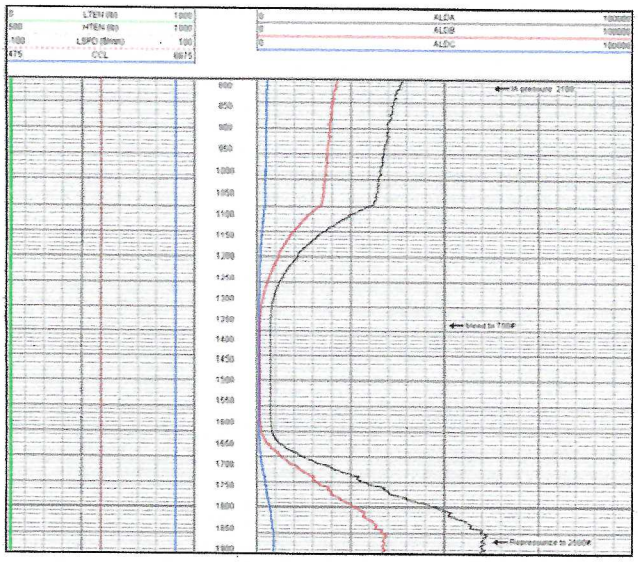


Figure 9: Well B stationary log showing response in signal strength as the pressure is manipulated.

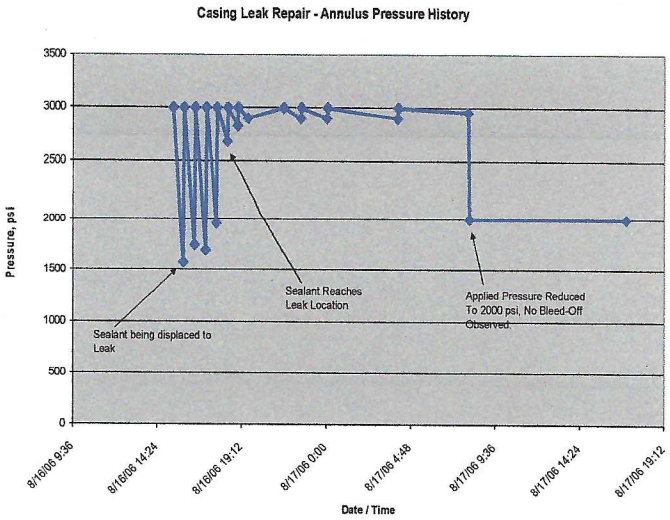


Figure 10: Graph of annulus pressure history during leak repair process.

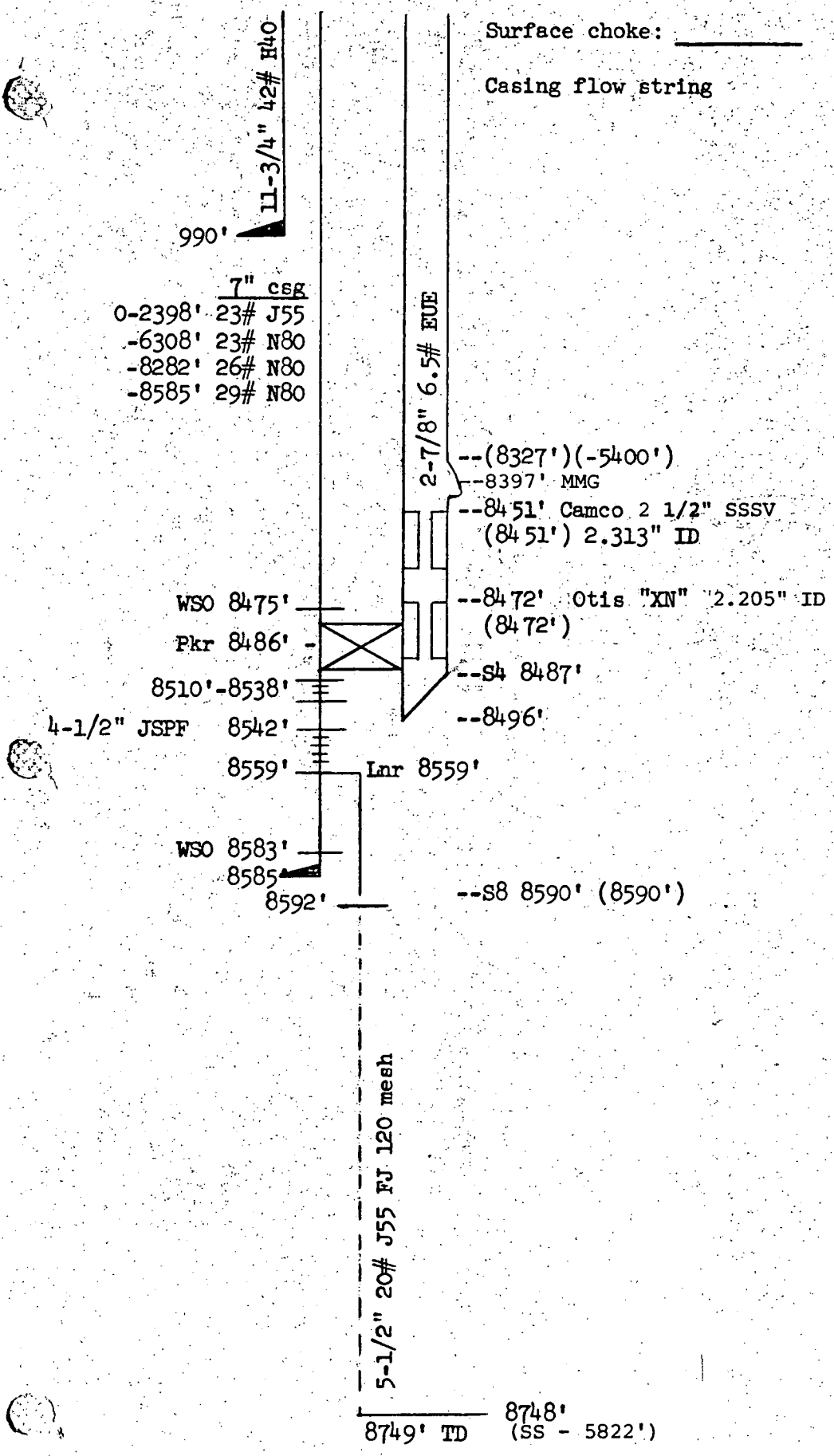
Elevation: [illegible]27"
DF: 6'

S[illegible]dard Sesnon 25

Surface choke: _____

Casing flow string

10/1/53 - Well spud
2/25/54 - Well completed
893' of 4-1/2" drill pipe + Johnston tester side tracked - old TD 4948' plugged back 3860'
5/24/73 - 6/6/73 Cleaned out to 8748', pressure tested csg, perforated for conversion to gas storage, ran tbg with gas lift valves
6/25/76 - 7/9/76 Cleaned out to 8748', ran tbg with SSSV
2/16/79-2/20/79 Replaced safety system



NOTE: Unable to use lower nipple - use M-lock for SSSV nipple. See wire-line tickets.

WELL VOLUME

	Cu.Ft.	Bbl.
Tubing	276	49
Csg/Lnr.	37	7
Annulus	1469	262

6/12/84

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Symposium on Casing Cathodic Protection Theory†

PREFACE

JOHN W. STOUT*

The protection of oil-well casing from outside corrosion is of prime importance to the oil industry. Cathodic protection is one method that is being applied on a large scale in several California oil fields to reduce or control outside casing corrosion. This symposium was conceived to briefly describe the theory of casing cathodic protection and to give the industry the benefit of the case histories of four current major casing cathodic protection projects in California

PART 1
FUNDAMENTALS OF CATHODIC PROTECTION AS APPLIED TO OIL-WELL CASING

F. W. SCHREMP‡

ABSTRACT

This paper presents a review of the processes of corrosion and cathodic protection of oil-well casing Various criteria used for the determination of cathodic current requirements are discussed A comparison also is made of the advantages and limitations of each criterion.

INTRODUCTION

This paper is concerned with the processes of corrosion and cathodic protection of iron in an earth-electrolyte environment. A review of corrosion processes is presented before discussion of cathodic protection because the concepts of cathodic protection are intimately associated with the processes of corrosion Electron flow is used as the convention of current flow throughout the paper Electron flow is opposite to the direction of positive current flow.

Corrosion

Corrosion in an electrolyte is an electrochemical process. Metal goes into solution at anode areas, and a current of electrons flows through the metal and is discharged at cathode areas The amount of current flowing is controlled by the relative areas of anodes and cathodes as well as the potential differences existing between the anodes and cathodes. Potential differences may be caused by surface defects in the metal and/or differential environmental conditions such as variations in electrolyte concentration, pH, and dissolved oxygen content, to name a few.

The corrosion of iron involves the solution of iron at anodic areas and deposition of hydrogen at the cathodic areas. The process goes on in such a way that the electrolyte remains electrically neutral; i e., an equivalent number of positive ions are displaced from the electrolyte for every iron atom dissolved into the electrolyte. Typical iron corrosion reactions are shown in Fig 1.

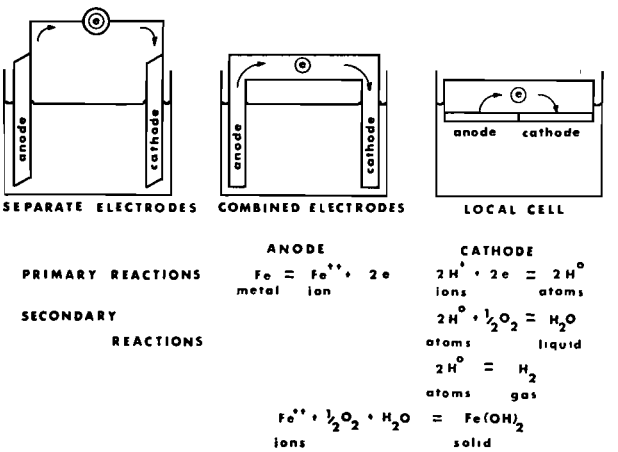

Fig. 1 (Schremp)—Corrosion Reactions of Iron in an Electrolyte

*Standard Oil Co of California, Taft, Calif
†Presented at the spring meeting of the Pacific Coast District, Division of Production, Los Angeles, Calif, April 30 and May 1, 1959
‡California Research Corp, La Habra, Calif.

Hydrogen film formation is the primary cathode reaction and tends to limit the corrosion process in two ways *1*, by insulating the iron surface from the electrolyte, and *2*, by increasing the tendency for hydrogen to re-enter solution and thus oppose the tendency for iron to dissolve. Formation of a hydrogen film is called "polarization" and removal is called "depolarization."

A hydrogen film usually is not sufficient to stop corrosion completely because the film may be damaged by the formation and release of hydrogen-gas bubbles or combination of hydrogen with dissolved oxygen. In either case, removal of the hydrogen film permits the corrosion process to continue. In acid solutions, the hydrogen film is destroyed mainly by the formation and release of hydrogen gas In alkaline solutions, the hydrogen combines with dissolved oxygen.

Dissolved iron usually is precipitated as iron hydroxide. If the precipitate falls on the metal surface, it may slow the corrosion process by acting like a protective coating Iron hydroxide also will react with dissolved oxygen to form ferric hydroxide and may reduce the corrosion rate if the supply of dissolved oxygen is limited.

It is apparent from this discussion that corrosion may be controlled if the cathode areas are maintained in a polarized condition and if hydroxide and insoluble reaction products are deposited on the cathode areas Perhaps the most effective way to achieve a polarized condition is to apply a counter current between the metal and the electrolyte sufficient to neutralize the corrosion current and thus prevent the metal from going into solution Application of a counter current is called cathodic protection. Subsequent sections of this paper will be devoted to the discussion of cathodic protection and the criteria that have been developed to implement its use.

Cathodic Protection

Use of a counter current has been called cathodic protection because the corroding metal surface is made the cathode in a cell reaction involving the metal and a sacrificial anode. Such a system is illustrated in Fig. 2

Electrochemically, magnesium is more inclined to dissolve than iron, and as a result electrons are released at the magnesium anode and flow through the external circuit to the steel casing, thereby offsetting the tendency for iron to dissolve. Of course, the fact that a metal is more electronegative than iron; i e., shows a greater tendency to dissolve, does not mean that the metal can be used effectively as a sacrificial anode to prevent the corrosion of iron. Sufficient electrons must be supplied by the anode to satisfy the demands of all the cathode areas on the steel surface High ground resistance and too small a potential difference between the anode and the casing will prevent most metals that are electronegative to iron from being useful as sacrificial anodes.

One way of circumventing the problem of too small a potential difference is to use a rectifier system that can

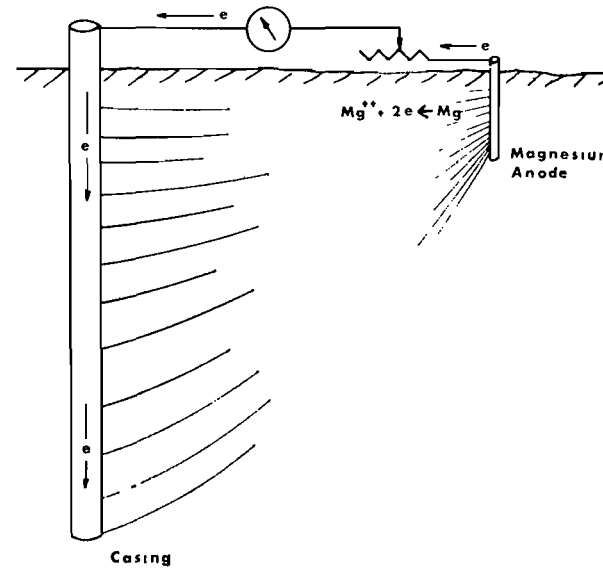

Fig. 2 (Schremp)—Cathodic Protection Using A Sacrificial Anode

supply large amounts of current and an anode bed made from scrap iron, carbon rods, or Duriron. The rectifier system can then be adjusted to supply the desired amount of current to the casing.

Determination of cathodic current requirements for oil-well casings is difficult because direct measurement of corrosion currents is impractical Instead, a number of criteria have been developed that are useful in estimating current requirements Several of the more widely used criteria are discussed in the following section.

Criteria for Current Requirements

Three of the criteria for cathodic current requirements are illustrated by the use of a polarization-potential diagram The diagram of a single anode and cathode cell is shown in Fig 3. Lines E_c-S' and E_a-S are the polarization curves for the cathode and anode, respectively. The point E_c represents the open circuit potential of the cathode area and E_a, the open circuit

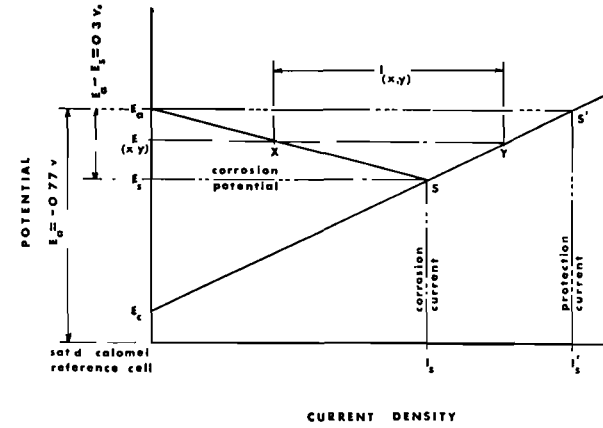

Fig. 3 (Schremp)—Polarization Diagram of a Single Corrosion Cell Illustrating Various Criteria for Cathodic Protection

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potential of the anode area Both potentials refer to a saturated calomel half cell Point S defines the corrosion potential E_S and current I_S of the combined cell.

Cathodic-protection theory requires that the cathode potential shift along S-S' toward Y and the anode potential along S-E_a toward X when a counter current is applied to the cell Theory also states that when X reaches E_a, i e, when the polarized potential $E_{(x,y)}$ of the cell equals the open circuit potential E_a of the anode, the anode current is zero and corrosion ceases. Point S', therefore, defines the external current I_S' required to stop corrosion.

Following is a brief discussion of the more widely used criteria.

1. Pipe-to-soil potential. According to this criterion, corrosion will stop when the pipe-to-soil potential is equal to the open circuit potential of the anode areas Laboratory work shows that the open circuit anode potential depends upon the activity of ferrous ions in the corrosive environment. Pure iron in equilibrium with a solution of ferrous ions, $Fe(OH)_2$ at pH = 8 3, has a potential of —0.77 volts referred to a saturated calomel half cell, —0 85 volts referred to Cu; $CuSO_4$ Hence, if the pipe-to-soil potential of the casing can be raised to a value of —0.77 volts referred to saturated calomel, corrosion will stop Schweidtfeger and McDorman[1] verified this behavior in a series of experiments involving the corrosion of steel in various soils. Of course, field conditions may affect the potential at which corrosion stops, but the result is to lower the potential requirement The potential criterion of —0 77 volts may, therefore, err on the conservative side Ballou and Schremp[2] have attempted to extend the usefulness of this criterion to oil-well casing by proposing a relationship between down-hole pipe-to-soil behavior and surface measurements Their work indicates that down-hole polarization may be estimated from surface measurements alone

2. Potential shift. Field experience has shown that the corrosion potential of steel seldom is more than 0 2 to 0 3 volts below the open circuit potential of the anodic areas This is true because polarization of buried steel is largely under cathodic control Reference to Fig. 3 shows that the first and second criteria are similar because they both depend upon raising the casing potential to the open circuit potential of the anode areas.

3. Current density This criterion is based almost entirely upon field experience Pipeline engineers have found that current densities ranging from 0.5 to 20 milliamperes per square foot of exposed pipe surface will prevent corrosion in surroundings ranging from high-resistivity soil to sea water. Current densities in the range of 1½ to 3 milliamperes per square foot appear to be satisfactory for the prevention of casing corrosion.

4. Break in the polarization potential, log-current curve. This criterion was first reported by Britton[3] in 1931 and is best explained by the use of polarization diagrams. Polarization under cathodic control is shown in Fig. 4a, and polarization under mixed control, in 4b. Associated with each curve is a plot of the polarization potential-vs -log applied current

Reference to Fig 4a shows that under cathodic control the cell potential is virtually the same as the open circuit potential of the anode area. Application of counter-current to such a system causes no change in the cell potential until a certain minimum current, I_S is exceeded. Application of currents greater than I_S causes the potential to increase. The increase in potential with applied current now obeys the Tafel equation for hydrogen overvoltage. Protective current is indicated by I_S' and corresponds to the break in the *E-vs.-log I* curve

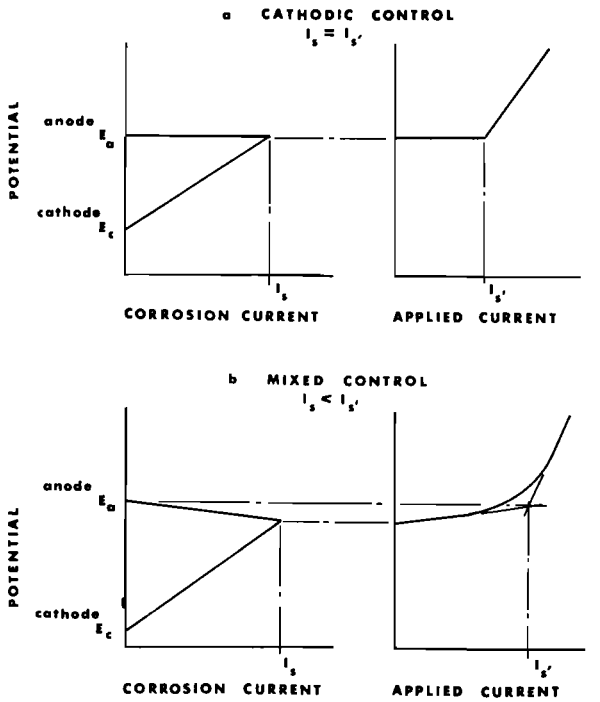

Fig. 4 (Schremp)—Effect of Polarization on Current Requirements

Fig 4b shows that the corrosion current I_S is less than the required protective current I_S'. Polarization behavior under mixed control is different from the behavior under cathodic control because the anode and cathode polarization potentials are not identical functions of the applied current. For low values of applied current, the composite polarization potential increases slightly At higher values of applied current, the slope of the *E-vs.-log I* curve continues to increase Ultimately, values of current are reached that cause the polarization potential to obey the Tafel equation. Mixed control makes difficult the determination of the current required to prevent corrosion One way to determine current from the *E-vs.-log I* curve is to extend the straight-line portions of the curve and use the point of intersection to indicate the proper current.

[1]References are at the end of Part 1

Eldredge and Haycock[4] studied current requirements under mixed control behavior and found that for oil-well casings a more accurate indication of current is given by the point at which the *E-vs.-log I* curve straightens out and begins to obey the Tafel equation Both the intersection and Eldredge-Haycock criteria are illustrated in Fig 5.

A fifth and final criterion involves the measurement of IR drops along the casing The plot of IR drops vs. well depth is called a potential profile. Inasmuch as the IR drops are a function of the corrosion current flowing in the casing, changes in the slope of the potential profile indicate regions where current is either being picked up or discharged from the casing. Corrosive intervals are indicated by negative slopes on the potential profile. Erasure of negative slopes by the use of counter-current is believed to indicate cessation of corrosion

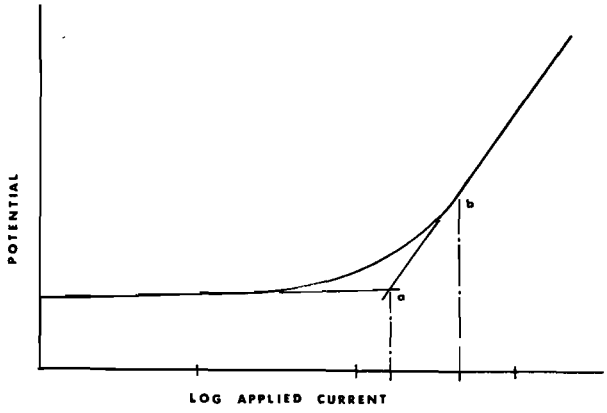

Fig. 5 (Schremp)—Current-potential Curve Showing Two Ways of Estimating Current Requirements

The measurement of potential profiles has been described in detail elsewhere.[5,6,7] For purposes of this paper, the potential-profile logging setup is shown schematically in Fig. 6. An explanatory profile is shown in Fig 7.

Reference to Fig. 7 shows that in region *A*, electrons are flowing from the casing and the slope of the potential profile is positive This indicates a cathodic region. In region *B* the slope is vertical, indicating that current is not entering or leaving the casing Such behavior might result if the casing were cemented through the interval Region *C*, which is anodic, shows a negative slope on the potential profile Electrons are entering the casing and metal is being dissolved. Region *D* is another cathodic area. No mention is made of the direction current flowing in the casing because it has no bearing on the interpretation of the potential profile. The slope of the profile through various intervals is important because it indicates the rate at which electrons enter or leave the casing. Severity of corrosion increases as the negative slope approaches the horizontal.

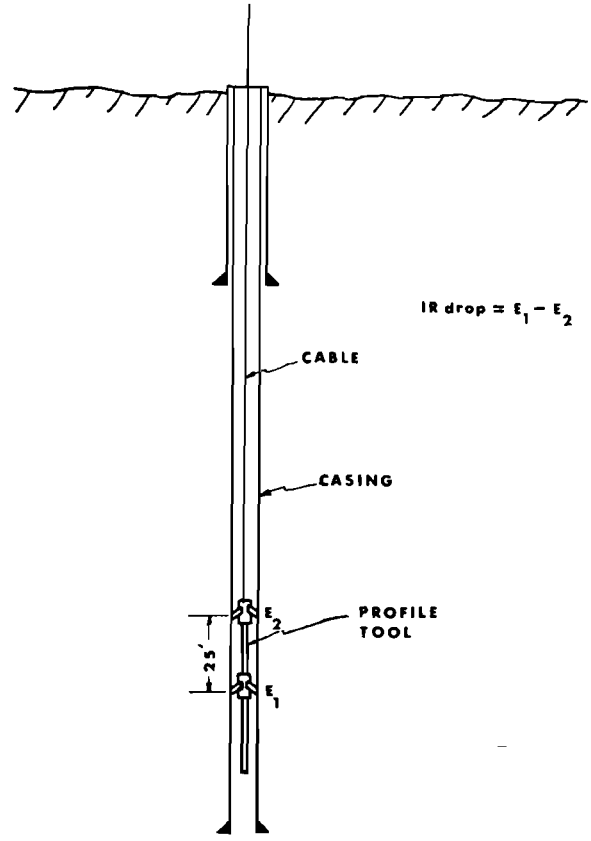

Fig. 6 (Schremp)—Casing-potential Profile Logging Setup

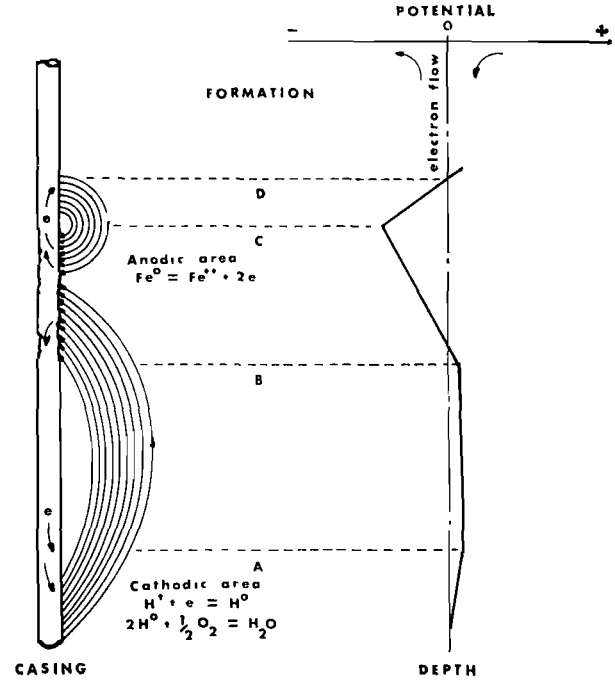

Fig. 7 (Schremp)—Casing-potential Profile

Table 1 (Schremp)

Advantages and Limitations of the Various Criteria Used to Estimate Cathodic Protection Current Requirements

Criterion	Advantages	Limitations
1. Pipe-to-soil potential of —0 85 volts (Cu; $CuSO_4$ reference)	Inexpensive measurement to make If used properly, will give a conservative estimate of current required.	Potential should be measured at the bottom of the casing. Usefulness of Ballou, Schremp-type surface measurements not completely evaluated.
2 Potential shift	Same as *1*.	Depends upon the assumption that the average corrosion potential of steel is 0.2-0 3 volts more cathodic than the open circuit anode potential. Potential shift also should be measured down hole.
3. Current density	Useful in making preliminary estimates of current requirements.	This is only a secondary criterion. Knowledge of cathodic-protection requirements for a given area must be available if reliable estimates are to be made.
4 "Break" in *E-log I* curve	Does not depend upon the open circuit anode potential to arrive at an estimate of current required. Gives a reasonably accurate estimate of current requirements. Relatively inexpensive to use.	Break in *E-log I* curve must be quite distinct if reliable estimates of current requirements are to be made Also, this method will not indicate the amount of current needed to prevent severe local cell action.
5 Potential profile	Indicates the probable location of gross anodic areas. Gives a qualitative picture of gross corrosion on the casing.	Erasure of negative slopes usually results in too low an estimate of cathodic current required. Profile cannot identify local cell action, hence erasure of negative slopes cannot indicate complete protection. Measurements are expensive to make.

SUMMARY

Cathodic protection involves the application of sufficient counter-current to neutralize the corrosion current and prevent iron from going into solution. Five criteria for estimating current requirements were discussed. Perhaps the most widely used criterion is the "break" in the *E-log I* curve Popularity of this criterion probably results from the relative simplicity of measurement. all measurements can be made above ground.

The relative usefulness of each criterion previously discussed is indicated in Table 1

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[3]Evans, U. R, Bannister, L. C; and Britton, S. C: *Proc. Royal Soc. A.,* **131**, 367 (1931).

[4]Haycock, E W: *Corrosion,* **13** [11] 89 (1957).

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Contributions of J. M. Pearson to *Mitigation of Underground Corrosion,* published by NACE, 1956.

PART 2
CASING CATHODIC PROTECTION — SAN MIGUELITO FIELD

JACK A. BIREN*

ABSTRACT

Cathodic protection of oil-well casings in the San Miguelito Field has been effective in reducing oil-well casing failures Ten amperes of protective current as determined empirically with potential-profile techniques were recommended to provide protection from "normal" corrosion and from interference from surrounding cathodically protected wells Separate rectifier control and anode beds which serve from 1 to 4 wells are used in the 160 well installations Anode-to-soil resistance has prevented the use of recommended amperage at many wells Most failures have occurred in the first 10 years of well life, indicating a polarizing effect Evaluation cannot be completed until the 10-amp current is applied to all wells However, some protection is afforded at present current levels.

INTRODUCTION

A cathodic-protection installation believed to be the first to include all well casings in an entire oil field was put in operation during February 1956 at Continental's Grubb Lease, Ventura County, California Casing failures which have been attributed to external corrosion began in 1940 and increased logarithmically with time until a total of 29 such failures had occurred prior to completion of the cathodic-protection installation In addition to the loss of two wells and the resultant redrilling of another, the repair costs ranged from $7,557 to $70,956 and averaged $33,200 per well. In five instances where production could be continued by flowing or gas lifting through macaroni inside the tubing, the casings were not repaired These are marginal wells where it has been established that the cost of wash-over work to recover the tubing and packers from the casing is excessive in relation to the indicated reserves.

The record of known and probable failure depths in relation to the top of cement outside the casing as determined by temperature surveys or calculations indicates that in 21 of the 29 wells where casings failed, the holes were found where the casing was *not* cemented In only 4 wells were the holes indicated to be in cemented pipe Holes located partly in cemented pipe and partly in uncemented pipe were found in 2 wells whereas the failure depths have not been pin-pointed in relation to the cement top in the remaining 2 wells. These data, of course, are not an attempt to evaluate the completeness of the cement sheath nor its actual effective top, but do tend to support the theory that a cement coating does give some protection against external casing corrosion.

*Continental Oil Co , Los Angeles, Calif

Determination of Current Requirements

Empirical methods were used to determine the amount of current to be applied to the wells at San Miguelito. In June 1954 a series of potential profiles were run in 4 Grubb Lease wells Three of these wells are situated on one well site with the casing heads less than 20 ft apart.

To determine the interference effect of adjacent wells, a current of 12 amp was applied to one of these wells while a profile was run on another — the two wells being in electric contact only through the ground A definite anodic slope was developed above 1,500 ft but none below that depth This effect was eliminated when all wells in the group were electrically connected at the surface.

A sharp anodic slope was noted in the potential profiles at the base of the surface pipe, which was cause for concern. To minimize the possible corrosion of the casing at this point, it was recommended that a casing centralizer be placed here in all new wells to assure metallic contact at this point.

In all 4 wells surveyed the potential surveys showed a tendency for external corrosion to occur over large areas of the casing These corrosive areas as defined by the profiles corresponded to the location of known failures in two of the surveyed wells No failures had been noted in the other two wells at that time, yet failure did occur in both prior to completion of the cathodic-protection installation.

The application of 3 to 5 amp of protection current was sufficient to remove all the anodic slopes from the profiles of the 4 wells tested. A trial run using 5 amp of impressed current was immediately started on one of the test wells and continued for a period of 6 months. At the end of this period the 7-in. casing was washed over and recovered from 5,200 ft The inspection and tests of the primary solids deposits revealed the following evidences of the effectiveness of the cathodic protection.

1 The corroded areas of the Grubb 61 casing were as predicted by the potential-profile survey.

2. A thin calcareous deposit was found in scattered areas over most of the pipe recovered indicating that cathodic protection was being effective to the depth of casing recovered.

3. The surface pipe effect was not sufficiently severe to prevent the use of cathodic protection

The recovered casing was replaced with a new casing string which was landed with a lead-seal casing bowl set over the stub of the old pipe at 5,200 ft. The new pipe was not cemented. Immediately after landing the

new pipe, a potential profile was run. In contrast to the smooth anodic areas found in the profile of the old pipe, a very erratic series of breaks in the curve was found in this same hole with new pipe and new mud Time is apparently a factor in the establishment of equilibrium conditions within the hole.

Five amperes of impressed current on the new pipe were effective in smoothing out the erratic potential profile. It was concluded at that time that the application of 5 amp should be sufficient to protect each well in the San Miguelito Field. Subsequent interference tests have indicated 10 amp are needed

Application of Cathodic Protection

The cathodic-protection installations for Continental Oil Company's 160 Grubb Lease wells use separate rectifier control and 3 anodes for each well. The selenium rectifiers used at 1 and 2 well installations are rated at 20 volts and 15 amp per well, whereas those for 3 and 4 well installations are rated at 40 volts and 15 amp per well Voltmeters are installed on each rectifier, and ammeters are provided to indicate the current to each well on multiple and single well units alike. All rectifiers are pole mounted.

Each rectifier is connected to an anode bed which has 3 anodes for each well served by the rectifier, i.e., the anode bed for a 3-well installation has 9 anodes Graphite anodes 3 in × 60 in are set 1 ft off bottom inside a 12-in. augered hole back-filled with coke breeze to 1 ft above the anode, then 1 ft of gravel caps the coke breeze and the hole is filled to the surface with dirt. Anode beds are placed at least 150 ft from the wells involved. Care was taken to avoid adjacent wells, pipelines, and other surface structures which might adversely effect the casing-to-earth potentials at depth.

Operational tests include the periodic readings of the voltmeter and ammeters at the rectifiers. Differences and variances in the readings are considered to be indicative of the anode-bed effectiveness and operational problems. It has been noted that in the moist shale areas the recommended current flow is attained at less than rectifier-capacity voltage. However, the sandy soils in other areas afford resistances which have prevented the minimum recommended current from being applied at capacity voltages Relocation of anode beds to areas where they may be wetted and the addition of anodes in some areas are being effected to reduce anode-to-soil resistance. Evidence of rodent damage to the insulating sheath of the buried cathodic-protection cables has been found. The extent of this problem has not been determined to date

Interference tests were run in a well situated on the easterly side of the lease in an area of dense well spacing. Potential profiles were run to a depth of 5,800 ft with several variations of current applications on the test wells and offsetting wells. Eight amperes were sufficient current to remove the anodic slopes from the potential-profile curve with current applied to the surrounding wells An *E-log I* curve run at the time substantiated the 8-amp requirement. It was concluded that an interference or stray-current problem does exist between wells under cathodic protection and those wells in a field either with insufficient protection or with no protection. It was therefore recommended that a minimum of 10 amp should be applied to each well in the field and that necessary revisions be made in the anode beds to achieve the 10 amp per well.

Results of Three Years of Cathodic Protection

In February 1959, the cathodic-protection system at Continental Oil Company's San Miguelito operations completed three years of operation A deflection in the logarithmic-failure curve (Fig 1) at the time cathodic protection was applied would indicate a reduction in the rate of increasing casing failures. The 13 failures which have occurred since application of the protective current include second failures in 3 of the wells while 9 of the troubled wells had less than the recommended protective 10-amp current applied because of operational problems Extrapolation of the failure rate prior to the application of cathodic protection would indicate that 15 additional casing failures might have occurred

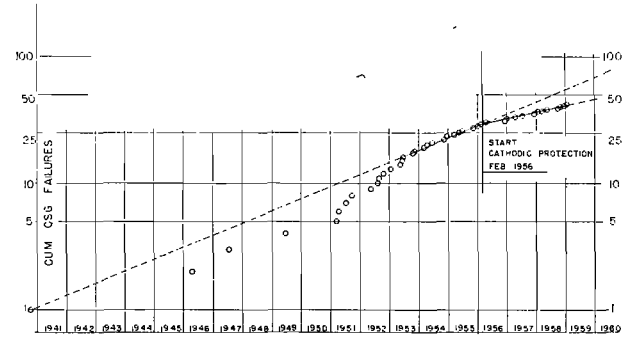

Fig. 1 (Biren)—Casing Failures Vs. Time
Continental Oil Co. — Grubb Lease — Ventura County, Calif.

during these past three years had the current not been applied It is realized, however, that other factors may have been involved in effecting this change. These factors include the following.

1. High well-completion rate during the 10-year period just before starting cathodic protection.
2. Condition and grade of the casing when run.
3. Nature of the drilling fluid.
4. Effect of polarization of the steel-casing surface.
5. Interference or stray currents from the cathodic-protection system itself.

The number of well failures which have occurred in each year of well service is indicated graphically in Fig. 2. It is noted that very few failures have occurred after 9 years of service. This is believed to be the effect of polarization The single failures in the extreme positions, 1st and 12th years, are perhaps indicative of the effect of the grade of casing used. The early failure was in cold-worked S-95 steel while the 12th-year failure was in H-40 steel. Inasmuch as both of the 19th-year failures occurred in wells with lower than

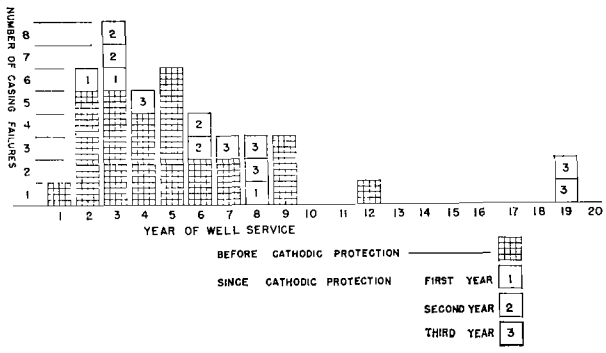

Fig. 2 (Biren)—Casing Failures Vs. Year of Well Service
Continental Oil Co — Grubb Lease — Ventura County, Calif.

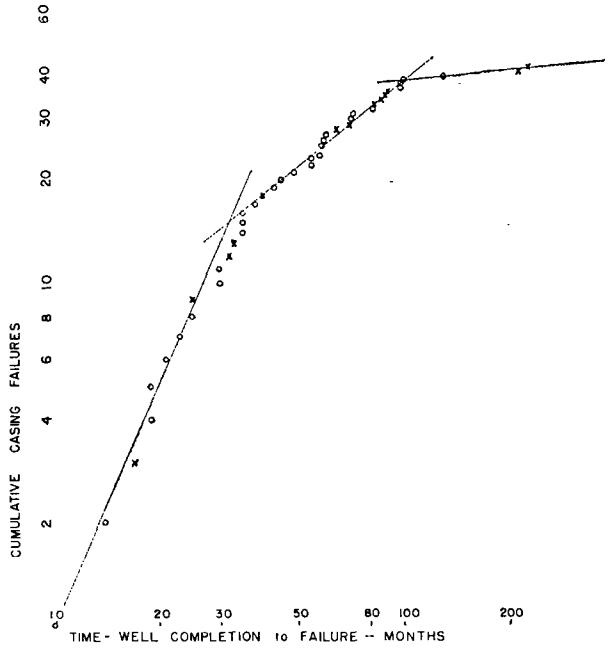

Fig. 3 (Biren)—Casing Failures Vs. Time in Hole
Continental Oil Co. — Grubb Lease — Ventura County, Calif.

recommended protective current, it is suspected that interference may be responsible.

The log-log plot of cumulative well failures vs. time from well completion to failure (Fig. 3) would indicate three phases in the process of failures It is believed that the middle slope between 32 and 102 months is perhaps the norm, whereas the failures earlier than 32 months occurred either before polarization or because of some pipe defect. The latter failures after 102 months (9 years) are accounted for by the grade of pipe, H-40, which is apparently more resistive to corrosion and failures caused by insufficient protective current or interference.

CONCLUSIONS

A reduction in the rate of increasing oil-well casing failures in the San Miguelito Field has been effected by the application of a cathodic-protection current during the past three years This reduction has been accomplished despite lower than recommended applied amperages on many wells. In fact, most failures which have occurred since application of the protective current have been in areas where anode-to-soil resistivity has restricted the use of recommended minimum amperages

Casing polarization or stabilization of electropotential conditions within the casing well-bore annulus has been effective in confining the critical period for external casing corrosion to the first 9 years of well life Field tests have shown that an interference or stray current problem does exist between wells under cathodic protection and those wells in a field either with insufficient protection or with no protection. The solution of the problem of applying the 10-amp current to those wells in resistive soil areas is necessary before evaluation of the San Miguelito oil-well casing cathodic protection system can be completed

ACKNOWLEDGMENT

It is the writer's desire to thank the Continental Oil Company for permission to publish this paper and to acknowledge the planning and field work done by J. D. Lung, J W. Wolfe, Jr., and H. F. Gerckens.

Appreciation is extended also for the use of the unpublished reports on this project by W. D. Greathouse, J. D. Sudbury, and J. E. Landers of Continental Oil Company's Research and Development Department, which were essential to the preparation of this paper.

PART 3
TWO YEARS OF CATHODIC-PROTECTION EXPERIENCE IN THE VENTURA FIELD

B. W. BRADLEY*

ABSTRACT

Cathodic protection was applied to approximately 500 of Shell Oil Company's Ventura oil-well casings in January 1957. Before that time Shell was experiencing in Ventura about 12 casing-corrosion failures per year, and the trend was increasing at about one additional failure per year During 1957, with cathodic protection applied to approximately 500 wells, only 9 casing-corrosion failures occurred. This was in line with anticipated results. However, continuing study of the problem during that year indicated certain features of the

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Ventura cathodic-protection system could cause stray current interference between wells on a given drilling island The conditions found most troublesome included *1*, grouping of anode beds in low-resistance soil near one well on multiwell drilling islands; *2*, location of anode beds near surface lines; *3*, shorted insulated unions; and *4*, abandoned surface lines Casing-potential surveys in three wells, which experienced corrosion failures in rapid succession during early 1958, confirmed the need to correct these causes of stray current Accordingly, all cathodic-protection units were turned off after approximately 18 months of operation as a precautionary measure while the problem was evaluated and corrected The nine 1957 casing-corrosion failures and 11 in 1958 were below the past failure trend and indicated that some degree of protection was obtained in spite of stray currents during these 18 months of protection and lack of protection during the last 7 months

By the end of 1958 cathodic-protection equipment in a test block of 46 wells was revised for stray-current control. Casing-potential surveys in 2 wells within the block revealed that cathodic protection can be applied to densely drilled wells without adverse effects of stray currents to that number of wells.

INTRODUCTION

Starting in 1949 efforts were made to control oil-well casing-corrosion failures in the Ventura Field The various schemes, which included full-string cementing, high pH drilling mud, bactericide in high pH mud, and oil-base mud, were either ineffective or too expensive. During this time the annual number of failures was increasing and it appeared that cathodic protection might be an effective and profitable way to reduce the failure rate Accordingly, investigations into the use of cathodic protection were begun in early 1955 The results of this work and the method of applying cathodic protection to the Ventura well casings were reported by Kerr[1] in 1957. As stated by Kerr the current potential-curve criterion, plus economic considerations, was used as the basis for selecting current requirements of 27 amp per well.

Kerr's work indicated cathodic protection could be applied satisfactorily to deep oil-well casings, and a test block of 27 wells was placed under protection. However, the casing-failure rate took a decided increase in 1955, as shown in Fig. 1, which indicated an increasing number of failures might be experienced in the coming years. Therefore, Shell undertook a field-wide installation of cathodic protection shortly after completing the test-block work, and before the results could be studied and evaluated. The installation of equipment was completed by January 1957, when 475 well casings were placed under cathodic protection New wells drilled in 1957 brought the total well casings under protection to about 500 by January 1958.

[1] Reference is at the end of Part 3

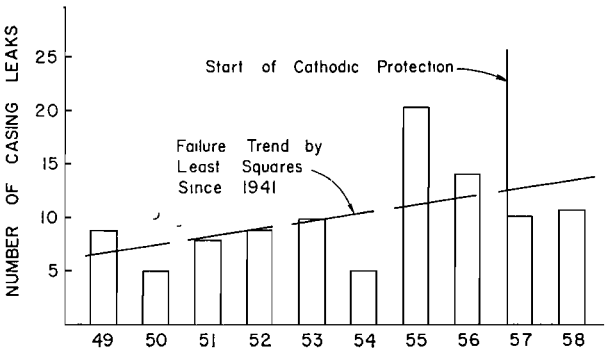

Fig. 1 (Bradley)—Annual Casing Failures — Ventura Field

Ventura Field Topography and Oil-production Facilities

Before discussing the main subject of this report, cathodic-protection stray currents, it is important to first visualize the characteristics of the field. This field is widely known as one of the nation's prolific oil producers due partly to 22 producing reservoirs. To develop these reserves, wells have been drilled into each sand on a given spacing. In localities where two or more sands overlie one another the spacing patterns often result in wells being drilled very near one another, say as close as 50 ft

The problem of close well spacings is further complicated by the rugged terrain of the area with elevation changes of as much as 300 ft occurring within a horizontal distance as short as 600 ft. Because of the rugged nature of the land, all semi-flat areas are at a premium. Thus, the high density of wells is further squeezed together on drilling islands cut from the hills.

Each of these drilling islands is served by pipelines supplying mud, fuel gas, and water Additional pipelines for the wells located on each island are flow lines, gas-lift lines, hydraulic-lift oil lines, and in some instances fuel gas and water lines for pumping equipment or well servicing These lines are buried where they cross the drilling island or lease roads, but are laid on the surface or pipe racks elsewhere. As the result of inevitable changes and continued development, some lines are abandoned in place or covered by many feet of fill dirt.

In summary, on the Shell leases in the Ventura Field, comprising about 1,860 acres, approximately 620 wells have been drilled This is equivalent to 1 well every 3 acres, which are grouped even closer together on the surface because of the rugged topography of the area.

Indications of Stray Currents

On completion of the installation work, field studies were undertaken in 1957 to check the circuits and to determine the degree of protection being obtained. Several anomalies were observed, but not understood at that time. The first well re-entered to study a wellhead-to-soil potential anomaly (Taylor 430) gave the casing-potential profile shown in Fig. 2 with all wells on the drilling island under protection. (For test

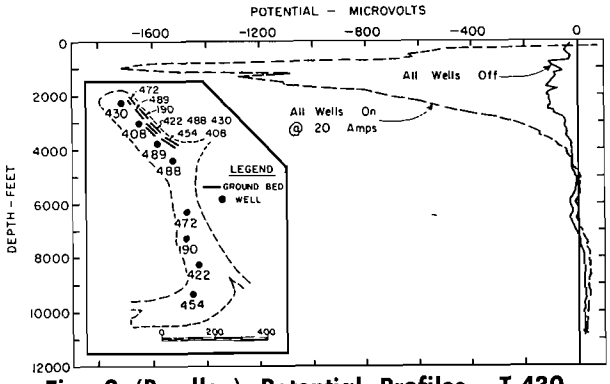

Fig. 2 (Bradley)—Potential Profiles — T-430 Original Anodes

purposes 20-amp protective current was used for all casing-potential surveys.) With Taylor 430 on protection alone a normal profile indicating protection was obtained. Taylor 430 was 1 well on an 8-well island, and as shown in the insert, the anode beds for all wells had been bunched in low-resistant soil near Taylor 430

Grouping of anode beds in this manner had been based on a study of ground-bed sites which revealed that soil type was the predominant factor controlling circuit resistance. Shale outcrops throughout the field provided circuit resistances much smaller than other soils, and had been selected as anode-bed sites in order to save power costs. It was reasoned that because all wells would be under protection, the current would seek out the well casing it was to protect without interfering with protection to other wells The profiles in Taylor 430 showed this was not the case.

It was hypothesized that the bunched anode beds were the major cause of interference Accordingly, the beds were revised to place each bed closer to the well it protected than any other casing, and repeat surveys were conducted. The results of this work are shown in Fig. 3. With all wells on the potential profile indicates a protected profile with somewhat less protection than if Taylor 430 was on protection alone With all wells on the drilling island off, a corroding condition was observed This condition was thought caused by stray current from anode beds protecting wells on adjacent drilling islands, but was of little consequence inasmuch

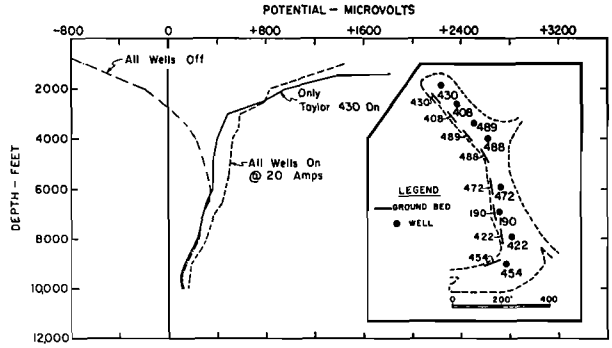

Fig. 3 (Bradley)—Potential Profiles — T-430 Revised Anodes

as all cathodic-protection units were to be on all the time.

1957 Activities

Throughout 1957 this problem was studied in the field, and although other situations of poorly located anode beds were found to be causing adverse conditions, none were as severe by wellhead-to-remote soil potential measurements as found at Taylor 430. Each of these cases was corrected as soon as the opportunity presented itself.

During 1957 Shell Oil Company experienced only 9 casing failures attributable to corrosion As shown in Fig. 1, this was 3 failures below the average for the last 4 years, and also 3 failures below the trend line established since 1941. Thus, in spite of the known interference problems, which were being corrected, the failure frequency was down somewhat.

Casing Failures in Early 1958

During the first 4 months of 1958, potential-profile surveys were made in 3 wells while they were being worked over to repair casing leaks. The results of these surveys are discussed individually following

Taylor 397

The potential profile obtained in this well, along with the anode wellhead arrangement on this island, is shown in Fig. 4. Wellhead-to-remote soil potentials taken before re-entering the well indicated what was interpreted as a questionable degree of protection. The flow of current to Taylor 398 could easily have been straying on to and off of Taylor 397 casing as suggested by the potential profile. It was thought at the time that the interfering stray currents were one or a combination of the following

1. Stray current from anode beds on this island
2. Surface-line stray currents from other anode beds; and possibly
3. Stray current from anode beds on nearby drilling islands.

However, with Taylor 397 protected alone (no interfering stray currents from this island or to surrounding islands) protection was still not attained Inasmuch as

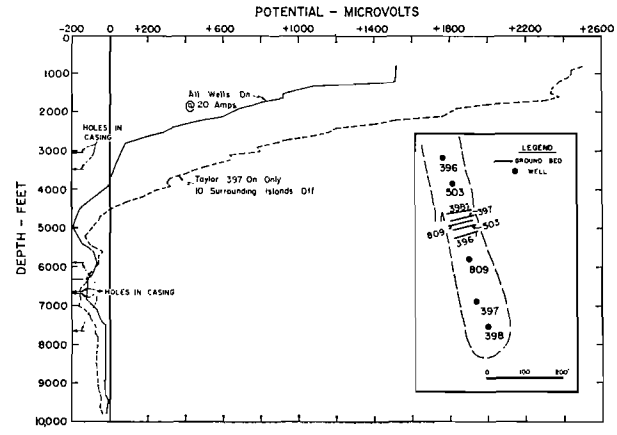

Fig. 4 (Bradley)—Potential Profiles — T-397 Original Anodes

the "on alone" profile was made with practically no chance of interfering stray current, it was assumed that proper protection for some time would be required to overcome the damage. At the time this explanation did not seem too logical, but was the only explanation possible.

Although six holes and a split were found in the casing, the well gave indications of a failure before installation of cathodic protection. Nevertheless, the conditions caused by the arrangement of these beds could contribute corrosion damage to this well casing After revising the anodes on this island, a survey was run in Taylor 809, a neighboring well, which indicated adequate protection was possible with proper anode placement as described later.

Taylor 462

A potential profile was run in this well during a workover to repair a casing leak. Based on the knowledge obtained from the Taylor 430 and Taylor 397 anode and well arrangements, it was suspected that Taylor 462 was being damaged by stray currents created by the situation shown in Fig. 5 Therefore, a few days before re-entering the well a new bed was installed on the Taylor 462 island (see Fig. 6) which should have corrected the situation. However, the profile revealed a condition which apparently was the result of surface-line stray currents and/or the residual effects of damage by the poorly placed anodes. Support for the latter theory was gained when another "on alone" profile, run after leaving the well protected by 35 amp for 15 min, was shifted a marked amount in the protected direction. The influence of stray current from *1*, anodes on surrounding drilling islands and/or *2*, surface-line stray currents is shown by the "both wells off" curve.

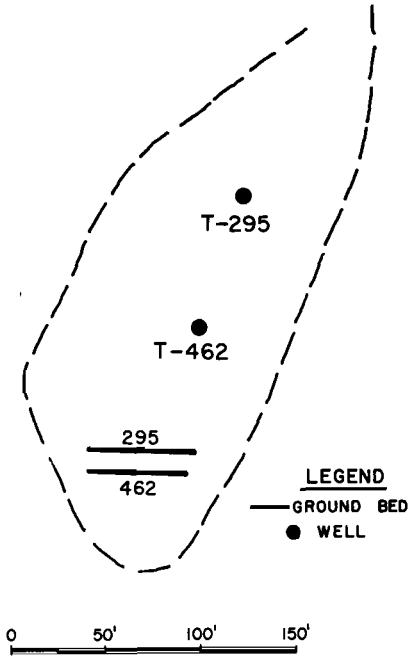

Fig. 5 (Bradley)—Old Position of Ground Beds and Wells — T-462

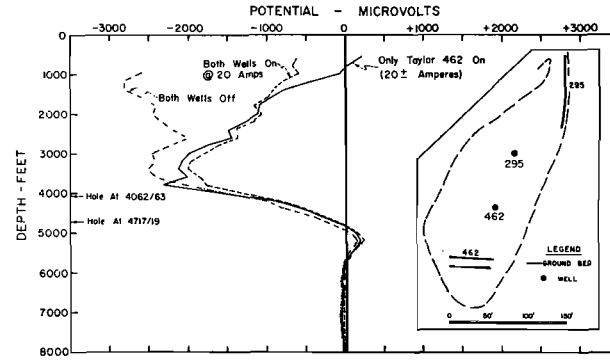

Fig. 6 (Bradley)—Potential Profiles — T-462 New Anodes

Taylor 453

The next casing-potential survey was run in Taylor 453 during a casing-repair workover. Wellhead-to-remote soil potentials on this well gave values thought indicative of protection Although the anodes were poorly located on this island, as shown in Fig 7 insert, there should have been no stray current from this island interfering with protection to Taylor 453. However, two anodic intervals, see Fig. 7, were revealed by the casing-potential profile. When protection to the casings of all wells on Taylor 453 island was turned off, the presence of stray current became evident.

Tests in 46-well Block

These experiences all apparently involved some manifestation of stray current which was neither thoroughly understood nor controlled. In addition to the stray current from poorly placed anodes, it was known that considerable stray current existed on surface lines at this time inasmuch as the work to control these had just begun. Furthermore, there was possibly some stray current flowing directly to these wells from anodes on nearby islands. However, the amount of stray current from each source was unknown.

In view of these conditions it was possible that damage might be occurring to an unknown number of well casings Therefore, it was decided to turn off

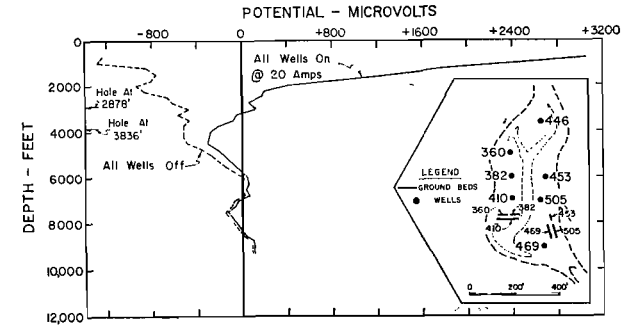

Fig. 7 (Bradley)—Potential Profiles — T-453 Original Anodes

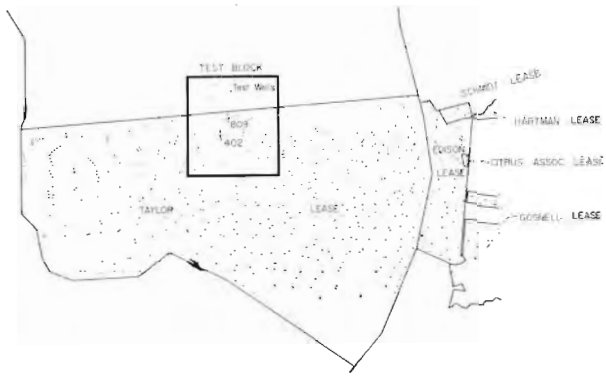

Fig. 8 (Bradley)—Test Block, Shell Wells and Leases

protection to all casings, and to thoroughly evaluate the problem in a selected block of wells. The block selected, see Fig. 8, contained many multi-well islands, large concentrations of surface lines, and two wells in which previous potential surveys had been made.

17-well Test

The first step consisted of revising the equipment to properly protect 17 wells in a group of 5 drilling islands located within the 46-well test block. New anodes were installed so each bed would be nearer the casing it protected than any other casing. The old anodes were left in place for comparative tests. Cables were installed to drain stray current from all surface lines back to the offending rectifiers. The current drained back was measured by permanent shunts, and could be adjusted by changing resistors as shown in Fig. 9 and explained later.

After completing this work a potential survey was run in Taylor 809, a well centrally located on a 5-well island with only the 17 wells under protection. It was also located next to Taylor 397 which was previously reported to have been subjected to stray currents. The first potential profile was made under the original conditions, i.e., old anode beds and no control of surface-line

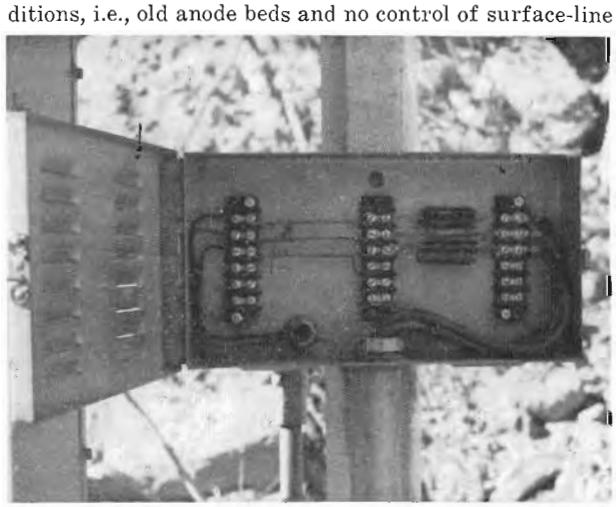

Fig. 9 (Bradley)—Drain Resistors and Shunts — Three-well Island

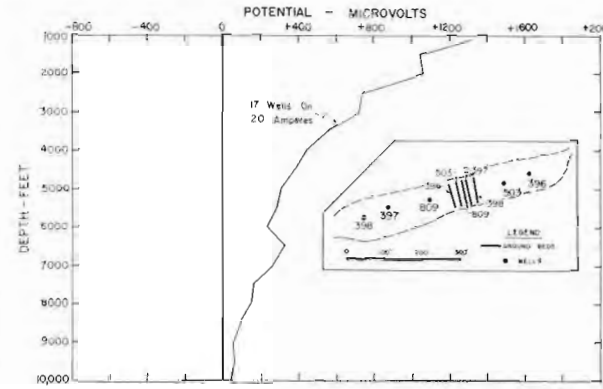

Fig. 10 (Bradley)—Potential Profiles T-809 Old Anodes

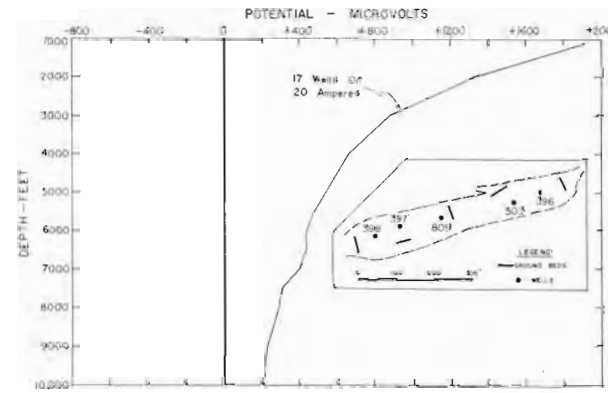

Fig. 11 (Bradley)—Potential Profiles T-809 New Anodes

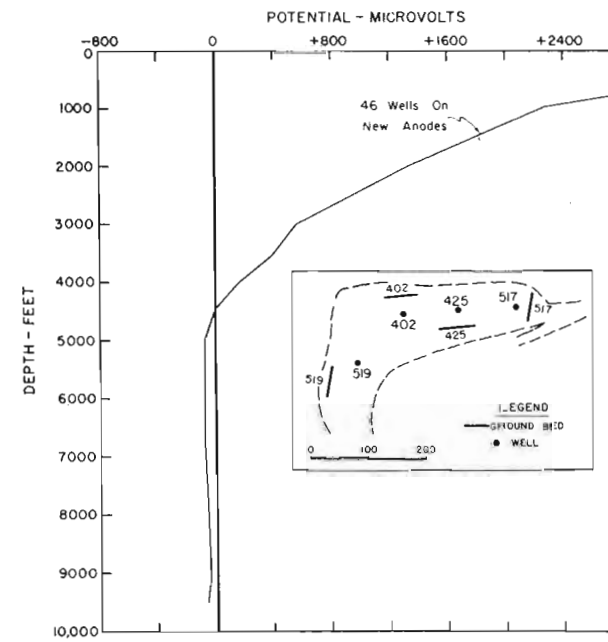

Fig. 12 (Bradley)—Potential Profiles — T-402 New Anodes

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stray currents as shown in Fig. 10. Although the apparent anodic interval at 1,500 to 2,000 ft could have been caused by a change in casing weight, the corroding condition at 6,000 to 6,500 ft was caused by stray currents.

All wells were then protected with the new anode beds and no surface-line stray currents. A potential profile indicating satisfactory protection is shown in Fig. 11.

46-well Test

The next step consisted of revising equipment for the remaining wells in the 46-well test block in the manner described previously, and making similar casing potential surveys in a well (Taylor 402) centrally located in the block (see Fig. 8).

Considering the experience in Taylor 809 the first profile was made with all 46 wells protected by new anode beds and surface-line stray current controlled. The surprising results, which revealed the casing to be unprotected below 4,500 ft, are shown in Fig. 12. In the ensuing investigation it was found that this well had been damaged at some time by stray current flowing through a shorted flow-line insulating union. Because the well had never been protected by properly placed anodes, the results of damage had never been overcome. In an attempt to overcome the theorized residual damage (protection had been turned off 5 months at the time) the well was protected overnight by 50 amp. On the following morning a repeat potential survey with all wells under ideal protection at 20 amp gave the results in Fig. 13.

To determine if the indicated protection shown in Fig. 13 resulted from the overnight protection at 50 amp, a repeat profile was made two days later. The results were the same as shown in Fig. 13. During the intervening two days the well was subjected to miscellaneous currents and ideally protected overnight by 20 amp as were all 46 wells.

Observations During Test-block Work

During the revision work in the 46-well test block several significant problems were encountered. These problems and other pertinent observations are summarized following.

1. Surface-line Stray Currents

Theoretically, to control stray currents on surface lines it is necessary to *1*, elevate lines near anodes on wooden blocks; *2*, move anode beds or pipelines when they are located too near each other; and *3*, establish a current-drain connection from each pipeline back to the offending rectifier. However, from a practical viewpoint all pipelines lying together in one group can be treated as one line by electrically bonding them together and providing one drain cable back to the rectifier. It was found in a few instances that some pipelines act like individuals and require separate drain cables for proper stray-current control. On multi-well islands several current-drain cables were usually required to drain

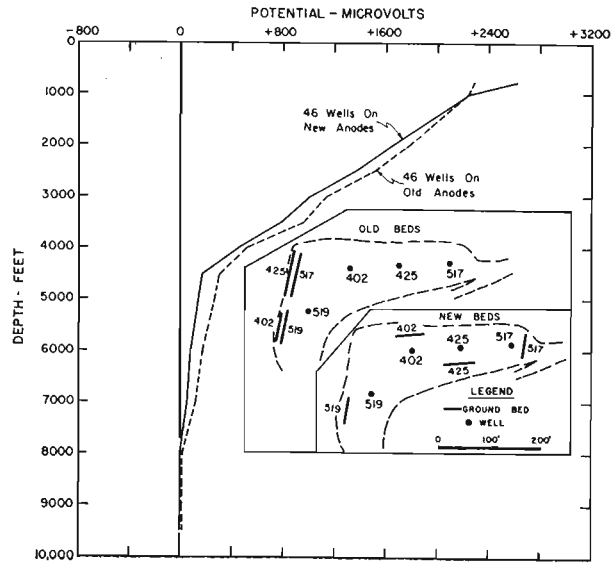

Fig. 13 (Bradley)—Potential Profiles — T-402 Old and New Anodes

current back to each rectifier. Fig. 9 illustrates the rather simple circuits on a 3-well island with a minimum of pipelines to pick up stray current. Fig. 14 illustrates the multiple circuits existing on an 8-well island crossed by numerous pipelines. To arrive at the proper drain current the stray current in each line (or group of lines) was measured under conditions of no-current and full-current output. The resistors were then inserted

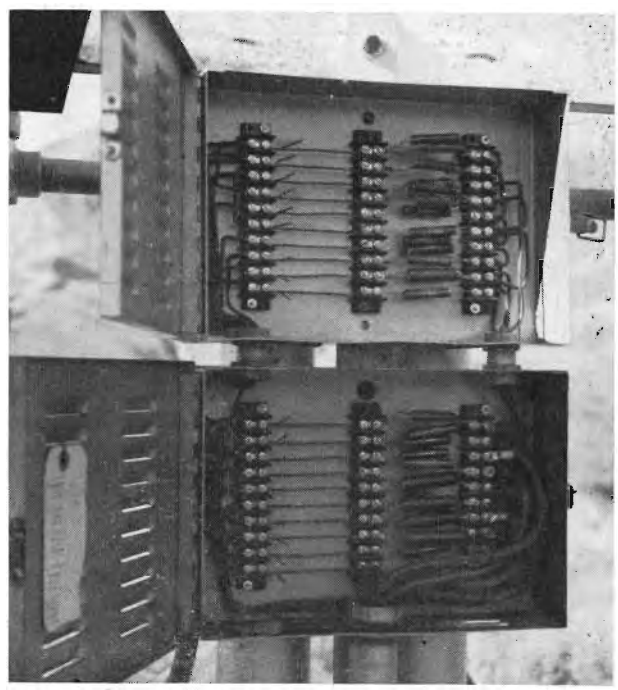

Fig. 14 (Bradley)—Drain Resistors and Shunts — Eight-well Island

Table 1 (Bradley)
Surface-line Stray Currents on Pipelines Leaving 46-well Test Block

Condition	Total Current Leaving Block, Amperes
1. No cathodic protection.	4
2. 45 old anodes on (no control of surface-line stray currents).	157
3. 46 new anodes on (with surface-line stray-current control)	0.8*

*Current entering block

on a trial and error basis until there was less than 0.1 amp of stray current on every line leaving the island.

To obtain some idea of the amount of surface-line stray current that existed under the original and revised conditions, an envelope was drawn around the 46-well area on a map, and the current flowing in the 198 lines that crossed the envelope was measured. The results, which are shown in Table 1, illustrate the severity of the surface-line stray current without control measures.

Fig. 15 illustrates how surface-line stray currents can cause interfering stray currents on well casings In the assumed case the surface-line stray current corrodes both the surface line and a nearby foreign well casing. However, the surface-line stray current can be controlled by draining the current back to the offending rectifier as previously described. Although this still leaves some stray current to flow directly through the soil to the nearby foreign well, even that can be overcome by placing the foreign well under protection as shown by the protected profiles of Fig. 11 and 13. Although Fig. 15 shows 2 amp of stray current flowing through the soil to the neighboring well and 2 amp of

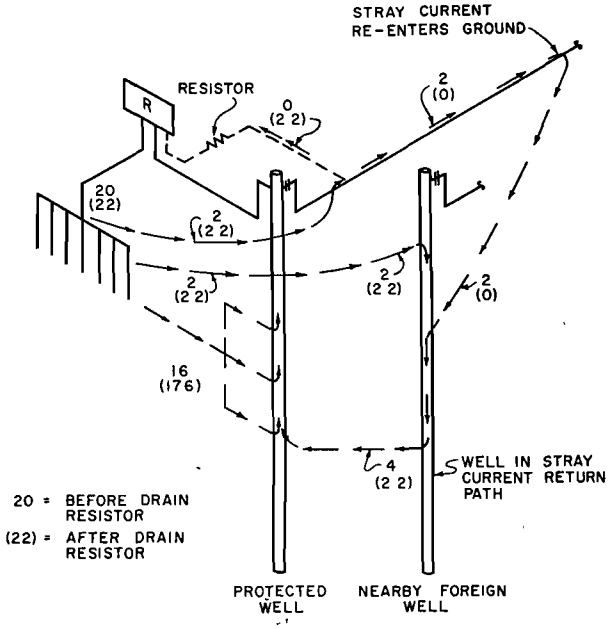

Fig. 15 (Bradley)—Paths of Cathodic-protection Stray Currents

stray current on the flow line, tests have shown that on multi-well islands the surface-line stray current is by far the largest and most significant stray current. For instance, detailed tests on a 5-well island indicate that stray current flowing directly through the soil was about 1 25 amp per anode bed while as much as 5 8 amp per anode bed were leaving the island via the surface pipelines

To control the surface-line stray currents, illustrated in Fig 15, and still obtain about 20-amp protection to the casing, it is necessary to increase rectifier output by approximately the amount of current drained from the surface lines. In Fig. 15, it is 2-amp drain or 22-amp rectifier output This 10-percent increase in current divides itself proportionately to the various parallel circuits Thus, 16 amp current flowing directly to the well casing is increased 10 percent to 17.6 amp and 2 amp stray current to the nearby well is increased 10 percent to 2 2 amp Nevertheless, control of the surface-line stray currents reduces the total stray currents attempting to flow onto nearby well casings. An analysis of these circuits is presented in Table 2.

Table 2 (Bradley)
Cathodic-protection Circuit Currents

	Without Drain Resistor	With Drain Resistor
Protected-well Circuit		
Current direct to protected well	16	17 6
Current via stray routes to protected well	4	2.2
Total current protecting well	20	19.8
Current returned by drain resistor from flow line	0	2.2
Rectifier output	20	22 0
Flow-line Circuit		
Corroding stray current	2	0
Foreign-well Circuit		
Corroding current directly through soil	2	2.2
Corroding current from flow lines	2	.0
Total corroding stray currents	4	2.2

2. Abandoned-line Stray Currents

In several instances during the revision work it was impossible to control the surface-line stray current in spite of direct electrical short circuits back to the rectifier from a certain pipeline. This was found to result from pipelines abandoned in place years ago and now located unknown very near the anode beds Old maps and the memories of old timers were helpful in locating abandoned lines when stray-current conditions typical of such conditions were encountered. These lines were removed to control stray currents

3. Shorted Insulated Unions

In several cases in which it was initially impossible to control surface-line stray currents by drain resistors, it was discovered that the troublesome lines were flow or gas lines connected to a well without an insulated union or through a shorted union. In such cases the current would flow directly to the well inasmuch as shorted unions provide a very low-resistant path to the well casing which provides an exceptional anode.

CONCLUSIONS

In view of the foregoing tests and analyses it appears that the 46 wells in the test block can be placed under proper cathodic protection. Similar techniques should apply to large groups of densely located wells, although other conditions now unknown might become apparent It has been shown that proper application of cathodic protection to well casings can only be accomplished by *1*, proper location of the anode beds; and *2*, control of the surface-line stray currents, which often requires *a*, removal of abandoned lines, *b*, adequate insulation of wells from connecting lines; *c*, elevation of lines when near anode beds, and *d*, occasionally moving either the anode bed or pipelines.

ACKNOWLEDGMENT

The author wishes to thank Shell Oil Company for permission to publish this report, and to acknowledge the assistance of F E. Field in planning and executing the test work, and the tireless efforts of W. W Salisbury, J A Trapasso, and J J Walker in gathering the large amount of data required to analyze these problems In addition, appreciation is extended to L B Nelson, Shell Pipe Line Corporation; E. W Wallace, Shell Oil Company; E W Haycock and W J Warren, Shell Development Company, for their helpful suggestions concerning the test work.

REFERENCE

[1]Kerr, A. W. Cathodic Protection of Casing, Ventura Field, Paper No 801-33-G, presented at the spring meeting of the Pacific Coast District, Division of Production, American Petroleum Institute, Los Angeles, Calif, May 16 and 17, 1957.

PART 4
CASING CATHODIC PROTECTION EXPERIENCE AT KETTLEMAN HILLS

FRED L. SMALL*

ABSTRACT

Forty-five installations for cathodic protection of well casing have been made at Kettleman Hills since June 1956. This report covers the results of operation, with special emphasis on the correlation of *E-log I* test (determination of wellhead potential vs. the logarithm of the drained current) to indicate current-drain demand with the actual current drain established by usage Theory and manipulation of the test have been covered in other papers and will not be discussed herein [1,2,3]

BACKGROUND HISTORY

General

The wells being protected are generally the most valuable wells They represent a good cross-section of all wells at Kettleman Hills and are scattered throughout the field. The wells have completion dates from 1930 to the present, and represent all producing zones.

There has been no casing failure reported in any of the 45 wells under cathodic protection Based on experience prior to cathodic protection, two casing failures should have occurred in this group if no cathodic protection had been applied

Anode Beds

All installations are graphite anode beds with air-cooled rectifiers. Both selenium and silicon-diode rectifiers have been installed; neither appears superior to the other at this time. Each installation was originally designed to serve one well only. However, inasmuch as usage has shown that surplus capacity was available

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[1] References are at the end of Part 4

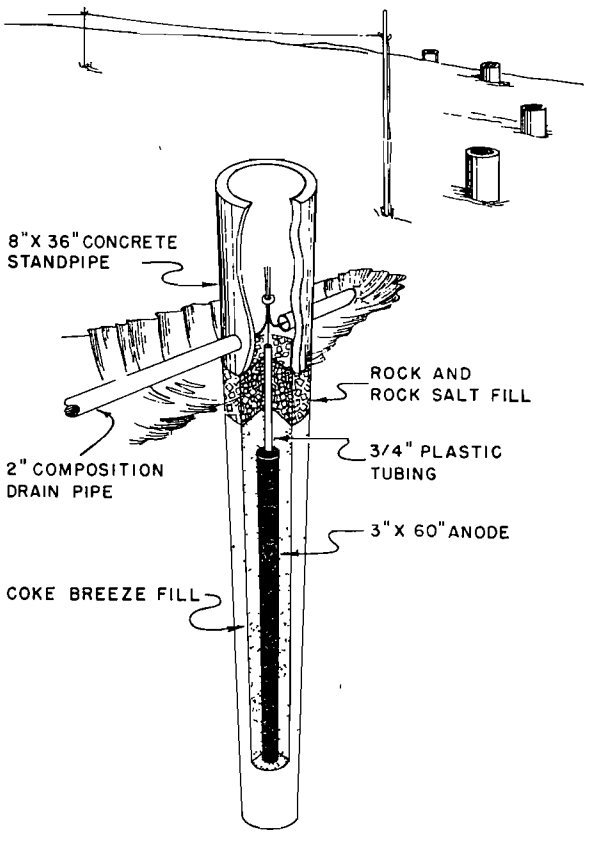

Fig. 1 (Small)—Vertical Anode-bed Installation

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at some installations, adjacent wells have been tied in to utilize this excess capacity for partial protection Four such dual installations are now in use, and more will probably be made

The first installations made were with anodes in series, laid in a trench. Much trouble has been experienced with rodents eating the insulation off the buried cable, necessitating many costly repair jobs. All later installations have utilized 3 in. by 60 in graphite anodes installed vertically, in 12-in. diameter by 10-ft deep drilled holes, and packed with coke breeze. The anodes are hooked up in parallel to a header cable protected by 2-in. composition drain pipe. No trouble has been encountered at these installations with rodents Fig 1 shows the general layout of later installations.

Where possible, the anode beds have been located near waste-water sumps or drainage ditches to keep loop resistance down. All other anode beds are watered periodically. Where watering is necessary, salt is added to the water.

PREDICTING CURRENT REQUIRED FOR PROTECTION

Surface-casing to Half-cell Potential

On the basis of a limited number of tests (3), (5), it has been determined that a surface-casing to half-cell potential of —1 00 to —1 02 volts will give a casing to half-cell potential at the bottom of the hole of —0 85 volts or more. Variations undoubtedly occur, but it is believed there are more overprotected wells than underprotected wells in the field

E-log I Curve

The *E-log I* curve of this paper is the "Wellhead Current Potential Curve" of Kerr,[1] "Log Current Potential Curve" of Haycock,[2] and "Null Potential Curve" of Ballou and Schremp[3] Half cell refers to the copper-copper sulfate half cell in common pipeline-protection use.

E-log I tests were made on 33 of the wells. All of the *E-log I* tests were run using a surface or wellhead connection and a half cell located approximately 300 ft from the well. All of the tests were made using the anode bed installed for actual protection A truck-mounted welding generator was used as the power source. Control of the generator output at low amperages is difficult, and a variable rheostat was used in most recent tests

A few pointers on actual testing, picked up by experience, are worthy of mention.

1. Apparatus should be checked out by running a test on a pipeline or unimportant well before being used for critical well testing A final check at the well site, using a water or gas line as the cathode before hooking up to the well, will prevent many poor tests.

2. Approximate amperage desired for each drain point should be predetermined, and the setting marked if possible.

3. An overdrain of current, even of short duration, nullifies the results. If an overdrain occurs during the first part of the test before the curve is reached, the test is probably of no value If an overdrain occurs, the test should be stopped and the well allowed to come back to its original state before the test is made This might take a few hours or several days.

4. Timing is quite important The actual duration of the drain period does not seem to be as important as having each drain period the same. A 4-min. drain period, with 1 min to read and reset, was considered optimum for the work at Kettleman Hills.

5. The "off" potential decays rapidly and must be obtained within a second or two to be of value. Plotting results as they are obtained will enable the operator to preset, approximately, the potentiometer or voltmeter and get more consistent readings

Table 1 gives the *E-log I* predicted drain compared with the actual drain established by use Summarizing this table, there appear to be:

11 tests — good correlation with actual
11 tests — fair correlation with actual.
11 tests — poor correlation with actual

This summary does not look favorable for the *E-log I* prediction However, other factors investigated change the picture considerably.

SOURCES OF ERROR

Insulating Flanges

All insulating flanges of wells to be protected were checked and repaired, where necessary, before running *E-log I* tests or applying protection Toward the latter stages of the survey, an improved method of testing insulating flanges was used (4) This new method and equipment indicated several flanges previously thought to be effective were actually defective

Repairing the defective insulating flanges has lowered the current drain dramatically in some cases. At other wells there has not been much improvement.

Well 8-21J is an example of the benefits obtained by repairing a defective insulating flange. This well had a good *E-log I* curve, with an indicated drain of 18 amp However, after putting it under cathodic protection, a surface casing potential of —1 00 volts could be attained only part of the time with 50-amp drain. The old method of testing insulating flanges showed all to be good With the new instrument, a 3-in. flange showed defective and was replaced in December 1958. The surface-casing potential immediately went to —1 07 volts. Since then, the current drain has been reduced to 35 amp and will probably be cut back more.

There is no way of knowing if defective flanges were shorted at the time of the *E-log I* test or became shorted later.

Effect of Overdrain of Current

The effect of overdrain of current of the *E-log I* test was noted at well 323-21J, where drain of 20 amp for about 1 min was inadvertently made at the start of the first drain period. The drain was stopped and the well allowed to rest about 15 min; then the test was started

Table 1 (Small)
E-Log I Vs. Actual Current Demand

Well No.	Date Installed	*E-Log I* Indicated Demand, Amperes	Actual Current Demand, Amperes	Difference in Amperes, Base-actual	*E-Log I* as Percent of Actual	Correlation[1]	Remarks
First Group							
87-20J	6-56	19	25	— 6	76	Fair	
344-20J	6-56	11	15	— 4	70	Fair	DIF, 12-58[2]
8-21J	6-56	18	35	—17	51	Poor	DIF, 12-58[3]
27-21J	6-56	23	35	—12	66	Poor	
324-35J	6-56	22	30	— 8	73	Poor	DIF, 12-58
32-2P	7-56	30	25	+ 5	120	Fair	DIF, 3-57[4]
36-2P	7-56	17	23	— 6	74	Fair	
343-3P	7-56	21	30	— 9	70	Poor	DIF, 12-58
341-12P	7-56	20	22	— 2	91	Good	
631-12P	7-56	28	25	+ 3	112	Good	
634-12P	7-56	14	15	— 1	93	Good	
642-12P	7-56	15	12	+ 3	125	Good	
E27-7Q	8-56	21	30	— 9	70	Poor	
8-8Q	9-56	25	25	—	100	Good	
36-17Q	9-56	9	13	— 4	66	Fair	DIF — not repaired
E67-17Q	9-56	32	30	+ 2	107	Good	DIF — not repaired
87-17Q	9-56	33	22	+11	150	Poor	
333-18Q	9-56	31	10	+21	210	Poor	
341-18Q	8-56	31	25	+ 6	124	Fair	DIF, 2-57
61-20Q	8-56	34	30	+ 4	113	Fair	
44-21Q	8-56	21	34	—13	62	Poor	DIF[5]
32-27Q	8-56	53	44	+11	121	Fair	DIF, 3-57
Second Group							
36-20J	5-58	45	25	+20	180	Poor	
47-20J	3-58	28	25	+ 3	112	Good	
331-20J	7-58	25	30	— 5	83	Fair	
332-20J	7-58	15	15	—	100	Good	
323-21J[6]	7-58	26	17	+ 9	153	Poor	
343-28J	4-58	36	40	— 4	90	Good	
65-30J[7]	4-58	21	45	—24	47	Poor	
27-34J	3-58	31	25	+ 6	124	Fair	
38-34J	3-58	15	20	— 5	75	Fair	
V32-7Q	3-58	39	40	— 1	97	Good	
632-7Q	12-58	27	27	—	100	Good	DIF, 12-58

Correlation first group	good.	6	fair	8	poor . . .	8
Correlation second group	good	5	fair.	3	poor	3
Correlation all wells	good . .	11 tested	fair . .	11	poor . .	11

[1]Good — difference less than 4 amp unless actual demand over 35 amp, then difference 10 percent or less.
Fair — difference 4 to 7 amp incl. unless actual demand over 35 amp, then difference 11 to 20 percent.
Poor — difference over 7 amp
[2]DIF = defective insulating flange — month and year repaired.
[3]8-21J — before repairing insulating flange, 50 amp would not keep current potential up to —1 00 volt Since repairing, current cut back to 35 amp
[4]32-3P — required 45 amp before repairing insulating flange.
[5]44-21Q — repaired insulating flange June 1957 40 amp brought current potential up to —1 00 volt Repaired December 1958, cut to 34 amp, probably will go lower
[6]323-21J — overdrain of 20 amp at start of test. Discard
[7]765-30J — loop resistance too high, could not get around bend of curve Probably has defective 6-in. insulating flange. Discard test

again The original casing to half-cell potential was —0.725 volts. At the start of the test the second time it was —0 764 volts The curve obtained was ragged, and the current drain indicated was 53 percent greater than that determined by operation Fig 2 gives a plot of the curve, along with a curve obtained from a similar well that checked very well with the actual.

There is a good possibility that the other three wells with "poor" correlation and excessively high *E-log I* indicated drain were also subjected to an overdrain during testing

This test points out the importance of avoiding an overdrain of current, especially at the lower amperage readings.

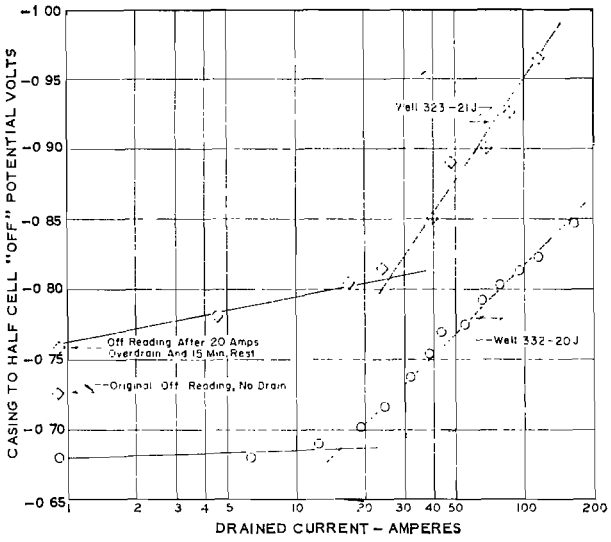

Fig. 2 (Small)—*E-Log I* Curves—Kettleman North Dome Unit

Disregarding the tests made on wells with faulty insulating flanges and the four tests suspected of overdrain, it is possible to come up with a different picture from Table 1.

Well No.	Predicted	Actual	Difference, Amperes	Correlation
87-20J	19	25	— 6	Fair
47-20J	28	25	+ 3	Good
331-20J	25	30	— 5	Fair
332-20J	15	15	—	Good
27-21J	23	35	—12	Poor
343-28J	36	40	— 4	Good
27-34J	31	25	+ 6	Fair
38-34J	15	20	— 5	Fair
36-2P	17	23	— 6	Fair
341-12P	20	22	— 2	Good
631-12P	28	25	+ 3	Good
634-12P	14	15	— 1	Good
642-12P	15	12	+ 3	Good
E27-7Q	21	30	— 9	Poor
V32-7Q	39	40	— 1	Good
8-8Q	25	25	—	Good
61-20Q	34	30	+ 4	Fair

9 — Good correlation = 53 percent } 88 percent
6 — Fair correlation = 35 percent
2 — Poor correlation = 12 percent
Total 17 100 percent

It is believed that with improved technique the accuracy and reliability of the test will be further improved.

Costs of *E-Log I* Tests

With the equipment we have used, two men are necessary to run the test and a third man to operate the welding generator. The actual test time is about 1 hour, 15 min, with another 45 min to set up and move. In addition, about 2 hours or more engineering time are needed to plan the program and interpret results.

The cost (equipment and manpower) of the foregoing test is approximately $50. As mentioned earlier, we have used permanent beds, already installed, for the anode. If it is necessary to install temporary anode beds for the test, the cost will be much higher.

Current Density

Table 2 gives the current drain necessary to give a surface-casing to half-cell potential of —1.00 to —1.02 volts, and the current density in milliamperes per square foot (ma per sq ft) of the exposed casing area which is defined for our purposes as all casing not behind other casing; that is, all casing exposed to formation including that behind cement.

The current density varies from a low of 0 5 ma per sq ft to a high of 2.1 ma per sq ft The average is 1 3 ma per sq ft.

The bare casing area, defined as the exposed area not behind cement, has also been calculated for a few of the newer wells. The current density based on bare casing area varied from 1 3 to 2.5 ma per sq ft.

Casing area would probably have merit in sizing installations if all variable and influencing factors were known However, it is currently not considered a reliable method to size installations at Kettleman Hills

CONCLUSIONS

1. Cathodic protection at Kettleman Hills has reduced the casing-failure rate.

2 The *E-log I* test to indicate current drain from a casing is only 70 percent accurate on the basis of tests tabulated. However, it is believed this rather low accuracy is probably the result of errors of technique and faulty insulation flanges, rather than to a fundamental fault in the test itself. With improved technique, it is believed the test should indicate the actual drain demanded within 10 percent.

3. The test should be a valuable aid in engineering studies aimed at determining the economy of protecting a field or a group of wells.

4. The usefulness of the test in sizing individual installations is something that would depend to some degree on individual circumstances, but to a large degree on the care and preparation devoted to each test.

The Future

Because of the good experience in reducing forecasted casing failures in 45 wells at Kettleman Hills, 100 more wells in this field are being considered for cathodic protection.

The economics of continued use of the *E-log I* method of predicting future cathodic-protection requirements has been carefully considered Because this method is subject to errors, and experience has permitted development of an average requirement, it has been decided to install future anodes and rectifiers of slightly greater capacity than the average current demand found necessary in the present 45 wells being protected cathodically. This plan will save the costs of *E-log I* tests, and will permit any excess capacity to be used to partially protect less economic wells that otherwise would not be protected. If more capacity is needed, additional anodes will be added and the rectifier changed.

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Table 2 (Small)
Current Density on Protected Wells

Well No.	Depth, Feet	Current Drain Required, Amperes	Exposed Casing Area, Square Feet	Milliamperes per Square Foot	Bare Casing Area, Square Feet	Milliamperes per Square Foot	Date Insulating Flange Repaired
287-19J	8,060	20	18,689	1 1			
8-20J	8,895	22	23,226	1.0			
36-20J	11,175	25	27,176	0.9			
47-20J	8,105	25	21,120	1 2			
87-20J	8,167	25	21,254	1 2			
331-20J	11,640	30	20,979	1 4	12,181	2.5	
332-20J	11,660	15	21,734	0 7	10,592	1 4	
344-20J	11,386	15	20,117	0 8	10,193	1 3	12-58
8-21J	8,217	35	22,011	1.6			12-58
27-21J	11,450	35	26,738	1 3			
343-28J	11,683	17	21,765	0.8	7,601	2.2	
H-6	10,624	40	21,878	1 8			
65-30J	9,143	40	22,995	1 7			
341-30J	8,265	45	21,980	2.0			
323-21J	10,910	40	22,499	1.8			
83-32J	8,290	35	20,825	1 7			
E72-33J	10,060	30	23,408	1 3			
27-34J	8,043	25	22,736	1 1			
38-34J	8,819	20	24,825	0 8			
324-35J	10,441	30	24,204	1 2			12-58
V45-1P	8,795	40	22,160	1 8			
E32-2P	10,035	25	20,342	1 2			10-57
E36-2P	9,775	23	19,784	1.2			
81-3P	8,032	25	17,928	1 4			
87-3P	7,981	25	26,595	0.9			
343-3P	10,173	30	23,329	1 3			12-58
341-12P	10,300	22	17,790	1 2			
631-12P	8,150	25	17,617	1 4			
634-12P	7,932	15	15,590	1 0			
642-12P	7,997	12	17,414	0.7			
E27-7Q	9,852	30	23,693	1 3			
V32-7Q	9,225	40	27,578	1.5			
V42-7Q	9,250	32	20,265	1 6			12-58
611-7Q	8,941	25	21,700	1 2			
632-7Q	9,170	27	20,525	1.3			12-58
8-8Q	7,992	25	23,162	1 1			
36-17Q	7,725	13	19,329	0.7			not repaired
E67-17Q	10,126	30	24,822	1.2			not repaired
87-17Q	7,925	22	22,042	1 0			
333-18Q	10,940	10	21,735	0.5			
341-18Q	10,010	25	22,809	1.1			2-57
61-20Q	7,095	30	23,250	1 3			
44-21Q	7,519	34	17,239	2 0			6-57 and 12-58
32-27Q	7,795	44	21,013	2.1			3-57
72-27Q	8,040	35	21,678	1 6			12-58

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PART 5
CASING CATHODIC PROTECTION — COALINGA NOSE UNIT PROJECT

C. E. HEDBORG*

ABSTRACT

The pipeline criterion of maintaining a minimum pipe-to-soil potential of —850 millivolts relative to a copper-sulfate reference electrode has been used in providing cathodic protection for well casings at the Coalinga Nose Unit A polarization period of 2,000 hours is required for wellhead potentials to reach equilibrium with a 25-amp current. However, short-term test data can be used to predict long-term polarization levels. Down-hole measurement indicates that protection extends to total depth of a 7,000-ft casing. Casing potentials were observed to decline 30 millivolts per 1,000 ft of depth after 42 days drainage time. At 300 days drainage time the decline had decreased to 10 5 millivolts per 1,000 ft.

Criteria for Protection

The pipeline criterion of maintaining a minimum pipe-to-soil potential of —850 millivolts with respect to a saturated copper-sulfate reference electrode has been used in determining well-casing cathodic-protection current requirements at the Coalinga Nose Unit (CNU), Fresno County, California

Current Requirement Tests

Tests to determine the cathodic-protection current requirements were conducted on 10 wells which were selected as being representative of all wells in the field These tests were divided into two parts: a short-term test period of 10 to 24 hours duration followed by a long-term test period of about 6 months duration.

The data obtained from the short-term tests were used as a basis for designing permanent, impressed-current cathodic-protection installations for the 10 test wells. These permanent installations were then operated and observed for about 6 months, following which a program of installing protection installations on all wells of economic value to the unit was started. There are at present 130 wells under protection at the CNU.

During the short-term tests, casing-to-soil potentials were measured only at the well head. Based on work conducted by other companies[1], it was assumed that the casing-to-soil potentials would decrease by 20 millivolts for each 1,000 ft of depth A 7,000-ft well, which is average for the CNU, would therefore require a wellhead potential of —990 millivolts in order to have an indicated potential of —850 millivolts at total depth. Fig 1 shows a schematic diagram of the equipment and circuits used during the tests The anode bed was located from 250 to 300 ft from the well. The reference electrode was placed on the surface of the ground, 300 ft from the well head and in a direction opposite from the anode bed

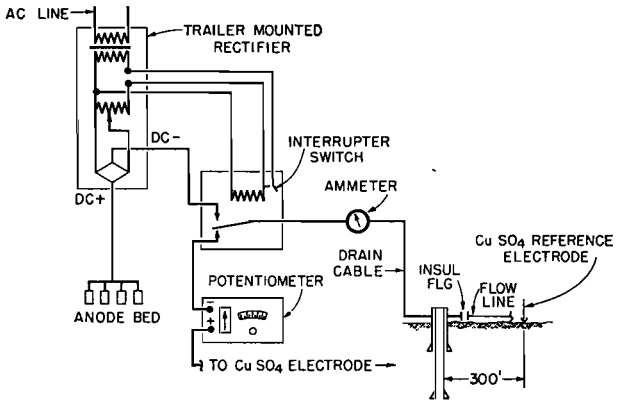

Fig. 1 (Hedborg)—Test Equipment

In order to eliminate the inclusion of ohmic (i e, IR drop) potentials, all casing-potential measurements were taken with the current momentarily interrupted. The circuit shown in Fig. 1 makes possible the measurement of power-off potentials with a minimum drain-current interruption time The results of the short-term tests are shown on Fig 2 In these tests we were trying to determine the current required to produce a power-off potential of —850 millivolts at total depth. As stated earlier, this would require a wellhead potential of —990 millivolts.

As indicated by Fig 2, the casings take an appreciable period of time to respond to electrical drainage.

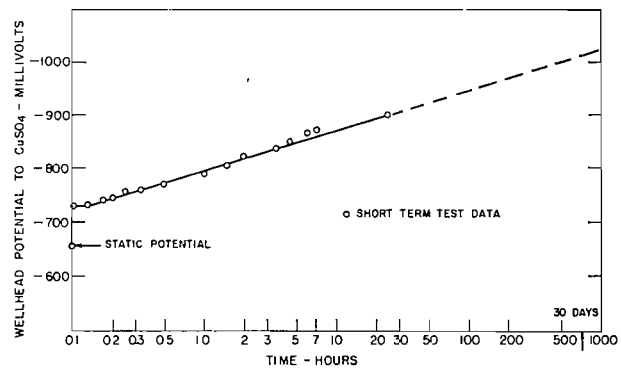

Fig. 2 (Hedborg)—*E-log* Time Curve — 25-amp Drain Potentials are measured with respect to a remote saturated Cu SO_4 reference electrode. All potential measurements made with power momentarily interrupted. All adjacent rectifiers within 2,000 ft shut down during these tests.

*Union Oil Co of California, Brea, Calif
[1] References are at the end of Part 5

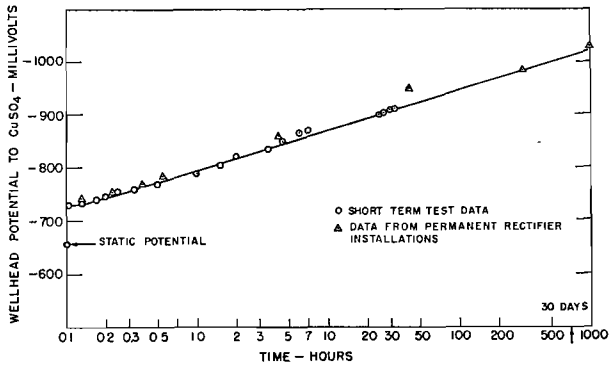

Fig. 3 (Hedborg)—*E-log* Time Curve — 25-amp Drain Potentials are measured with respect to a remote saturated Cu SO_4 reference electrode. All potential measurements made with power momentarily interrupted. All adjacent rectifiers within 2,000 ft shut down during these tests.

However, by plotting the short-term test data as potential vs. the logarithm of the drainage time and by extrapolating the resulting curve, it appeared reasonable to assume that a 25-amp drain current would produce the desired wellhead potential in about 30-days time The curve shown on Fig. 2 is typical of all of the wells tested Based on these short-term tests, permanent-rectifier installations having direct-current capacities of 30 amp and 50 volts were installed at the 10 test wells.

Fig 3 shows the *E-log* time curve for the same well shown on Fig. 2 after 1,000 hours at 24 amp It can be seen that the points fell on the curve indicated by the short-term tests. Although not shown on this curve, the wellhead potentials stabilized at about 1,060 millivolts after 2,000 hours drainage time at 24 amp.

A down-hole potential survey was conducted on one of the test wells after it had been on protection for 42 days. This survey consisted of lowering a single-point contacting tool inside the casing and measuring power-off potential differences, for various depth positions, between the casing and a surface reference electrode. The results of this work are shown on Fig. 4. The same type of survey was conducted on another well in the field after it had been under protection for 300 days. The results of this survey are also shown on Fig. 4.

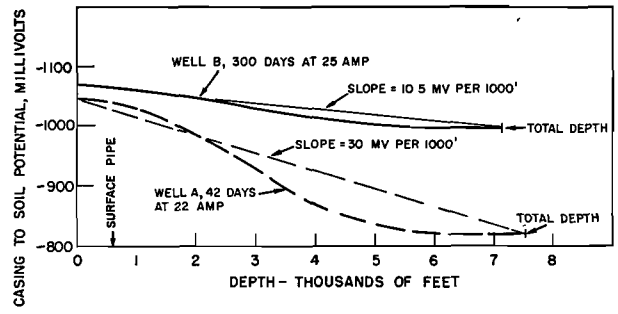

Fig. 4 (Hedborg)—Casing-to-soil Potential Vs. Depth Potentials are measured with respect to a remote saturated Cu SO_4 reference electrode. All potential measurements made with power momentarily interrupted. All adjacent rectifiers within 2,000 ft shut down during these tests.

These two curves show that there has been a considerable reduction in the slope of the attenuation curve The average slope for Well A after 42 days drainage was 30 millivolts per 1,000 ft The slope for Well B after 300 days drainage time was 10 5 millivolts per 1,000 ft The reduced slope of the attenuation curve is, it is believed, the result of a gradual accumulation of calcareous coatings on the casing. The relatively flat slope for Well B probably indicates that an equilibrium condition has been reached The 30-millivolt attenuation figure obtained on Well A indicated that a wellhead potential of —1,060 millivolts was required for the protection of 7,000 ft of casing. A rectifier output of about 25 amp was required to maintain this potential. Up to December 1958, all the rectifiers in the field were operated at this current value. At this time, however, the down-hole survey on Well B indicated that the wells were being overprotected. Gradual reductions in rectifier output are therefore being made so as to yield wellhead potentials that are commensurate with the 10.5-millivolt attenuation figure. At the present writing the amount of current reduction possible has not been accurately established

Results to Date

In order to minimize interference, all anode beds were kept a minimum distance of 200 ft from the nearest surface facility As an additional safeguard, the surface facilities are given partial protection by the application of a 1-amp drain at each protected well. This current is applied by installing a bypass resistor around the flow-line insulating flange. To date, no interference damage has been evidenced

Some failures of silicon-diode rectifier elements have occurred as a result of lightning storms. Most of these failures took place during a storm which the local power company classed as unusually severe. Our present opinion is that these lightning failures do not constitute a serious problem The costs to place a damaged rectifier back in service have averaged $25. This includes material and labor The benefits of the silicon diodes are: *1*, higher conversion efficiency; and *2*, greater resistance to high ambient temperatures Under the conditions prevailing at Coalinga it is believed that these advantages justify the continued use of silicon rectifier elements.

The anode beds are of the graphite-rod type with each rod being installed in a 14-in. diameter, 20-ft. deep hole. The annular space surrounding the 4-in diameter rods was filled with calcined petroleum coke. The installations at Coalinga are all of the single-well type: that is, a separate anode bed and rectifier is installed for each well Anode beds of from 5 to 8 rods were installed at a distance of from 250 to 300 ft from the well head At a few sites it has been necessary

to provide facilities for wetting the anode beds in order to reduce contact resistance.

Experience has indicated that there are many ways in which an insulating joint can become inoperative For example, it has been found that the insulation material in certain types of fittings is easily damaged As a result of this, we consider it desirable to make periodic routine checks on all insulating joints in the field. These routine checks have led us to the conclusion that the flange-type insulation joint is the most reliable. A uniform color coding has proved a valuable aid in preventing the accidental bypassing of insulating joints by copper tubing fittings such as on pressure gages, flow meters, etc

CONCLUSIONS

There have been but two casing failures at the CNU during its life. One of these was attributable to external corrosion; this failure occurred on a 14-year-old well. The fact that no additional failures have occurred since protection was first applied in April 1957 is not sufficient evidence to permit drawing of conclusions as to the efficacy of cathodic protection. However, based on theoretical considerations, favorable pipeline experiences, and published data[2] on the results of full-scale field-evaluation tests, we believe cathodic protection to be an effective method of preventing external casing corrosion.

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Electromagnetic Casing Inspection Tool for Corrosion Evaluation

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Abstract

Pipe corrosion is a natural phenomenon in the harsh environment of oil and gas production wells, costing billions of dollars each year. Monitoring such corrosion allows for timely mitigation to prevent leaks, environmental damage, or catastrophic failures.

Corrosion of pipes is inferred from measurement of internal diameter and wall thickness. Mechanical finger calipers provide a high-resolution image of the internal pipe surface. Ultrasonic tools measure both the internal diameter and thickness of a single pipe, providing the pipe is filled with a fluid. Production tubing is a barrier to caliper, ultrasonic, and flux-leakage electromagnetic tools, preventing the assessment of outer casings. Remote-Field Eddy-Current (RFEC) tools respond to the total metal thickness of all the combined casings. The measurement is valid in single and multiple casing strings and is largely insensitive to the kind of material filling the pipe.

This paper presents a new slim electromagnetic (EM) imaging tool enabling casing assessment without removing the production tubing. The tool excites eddy-currents in the tubulars using a powerful low-frequency solenoidal transmitter. Distribution and strength of the eddy-currents depend on the geometric properties of the casings, their EM properties, and the presence of defects. The tool operates in the RFEC regime using large transmitter-receiver spacings, in which the measurements directly determine the total metal thickness. Mandrel-mounted coils provide the average total metal thickness, and eighteen small pad sensors around the tool provide an image of local pipe wall metal loss.

The combination of low- and high-frequency images, together with the average total metal thickness, provides a quantitative, high-resolution assessment of pipe condition. Log examples show detection of casing joints, additional casings strings, and presence of corrosion damage in the low- and high-frequency images.

Introduction

Corrosion is a relentless process with electrochemical, chemical or mechanical origins that is difficult to slow down: it is a 'silent killer' (Acuña 2010). In the oil and gas industry corrosion monitoring is used to assess the well condition as a basis for planning intervention and mitigation strategies. Among all the high-technology systems and equipment that are installed in oil and gas production wells, the corrosion of well casings causes the most problems. Apparently stable casing can suddenly develop a leak that may be the first evidence of a severely corroded section that left untreated may force abandonment of the well in the near future.

Corrosion can appear on both the external and the internal casing surface. The key to corrosion prevention lies in inspection. The location and severity of corrosion damage relates to the hydraulic isolation provided by both the cement's and the casing's integrity. Multiple assessments may be needed to develop a practical prevention process. Various tools have been developed to evaluate and monitor pipe corrosion. They are divided into three groups:

- Mechanical calipers provide only the internal diameter of the inspected tubular.
- Ultrasonic tools measure both the internal diameter and the wall thickness of the tubular. The wall thickness can, however, only be determined for the inner string in a multi-string configuration. The ultrasonic measurement

requires a fluid-filled tubular; it makes a 360° scan of pipe and cement quality and distribution. Some ultrasonic tools focus their beams on internal corrosion and internal casing damage caused by processes other than corrosion.

- Electromagnetic tools evaluate the corrosion in any environment (including gas-filled tubulars). These tools are classified in two groups;
    a. Flux leakage tools measure magnetic-flux anomalies, which makes them well suited to detect pitting, holes and corrosion patches only in the inner string. These are not designed for large-scale corrosion or multiple casing-string configurations.
    b. Remote-Field Eddy-Current (RFEC) tools measure the response of the transmitted electromagnetic (EM) field. These tools are well suited for large-scale corrosion, vertical splits, and large holes as well as operation in multiple casing strings.

The new RFEC electromagnetic casing inspection tool measures both internal and external corrosion. Its slim 2 ⅛-in. diameter allows deployment through tubing to quantitatively evaluate single or multiple casings through the tubing or below the tubing. It assesses total metal thickness, inner diameter, and inner casing properties as well as provides high-resolution imaging of the local metal thickness and innermost pipe surface. These capabilities are used to identify corrosion or physical damage such as splits, holes and partially collapsed sections. Pipe integrity is provided in both depth and azimuthal position.

Theory of Operation

Oilfield wells consist of long strings of concentric ferrous tubular casings, with the innermost generally being production tubing. The non-destructive technique of eddy-current inspection of these tubulars is particularly advantageous for the oilfield geometry where the tool with its EM transmitters and receivers is situated inside the innermost pipe. This method uses a transmitter solenoid (Tx) excited by an alternating current of angular frequency ω (**Fig. 1**). The associated EM field and secondary field from induced eddy-currents in the surrounding conductive pipes induce a voltage in a separate receiver coil (Rx). EM and geometric parameters of the pipes are determined from measurements of the complex mutual impedance Z between Tx and Rx

$$Z = V/I \tag{1}$$

where I is the transmitter current, V is the receiver voltage of a given transmitter-receiver pair where an $exp(i\ \omega\ T)$ time dependence is assumed. The impedance Z is complex valued with amplitude and phase. The tool generally measures a given impedance phase as a phase shift Δφ relative to the value in the absence of metal pipes—the air-calibration. Similarly, amplitudes are generally expressed as logarithmic attenuation in dB relative to the value for the air-calibration.

The tool response is like a poorly coupled and lossy transformer where the pipe acts as coupling between primary (Tx) and secondary (Rx) inductors. For a single pipe, this mutual impedance is composed of flux-coupling through the medium inside the pipe and of contributions by flux passing through the metal and—at sufficiently low frequencies—propagation outside of the pipe. The magnetic field inside the tubular has a dominating axial component. The EM field is strongly affected by circumferential eddy-currents inside the metal. Changes in the properties of the metal—such as thickness or diameter variations—manifest themselves in corresponding changes of the mutual impedance Z. A localized flaw or metal-loss present in the pipe will perturb the circumferential eddy-currents around the defect. This generates a localized perturbation of the EM field that can be used to detect the flaw as long as the sensor is sufficiently close (**Fig. 2**).

The measurements distinguish two types of physical parameters: Firstly, physical parameters that are averaged over the circumference of a given pipe section and, secondly, high-resolution images (two-dimensional) of physical pipe parameters. The physical parameters are

- average total EM thickness of the surrounding pipes
- average inner diameter of the pipe (ID $= 2a_1$ where a_1 is the average inner radius of the pipe)
- average ratio of magnetic permeability to electrical conductivity (μ/σ)
- high-resolution image of the pipe EM thickness and flaws
- high-resolution image of the inner surface to discriminate flaws on inside surface of the pipe from those outside.

The appendix provides a short summary of the EM fields in cylindrical media. The EM fields from an axial transmitter separate into three regimes: near-field, remote-field and a transition zone between the two with a complex field behavior (**Fig. 3**). The RFEC regime is used for measuring both the average EM thickness of the tubulars and for generating the high-resolution thickness image to detect flaws. The near-field eddy-current (NFEC) regime is used to determine the average inner diameter ID of the pipe, the average EM property ratio μ/σ, and the high-resolution discrimination image of flaws present at the inside pipe surface.

Tool Description

The tool provides four distinct measurements, as follows:

Remote-field.

1. Average metal thickness made from mandrel mounted coils with long spacing. Multiple receivers, all at sufficiently large offsets to be in the remote field region, are used to remove ghosting. This extra response is caused when the transmitter passes in front of a large defect that is seen in addition to the desired response when the receiver is in front of the defect. Although the thickness is almost a linear function of the phase shift, inversion modeling provides more accurate values accounting for nonlinearity.

2. High-resolution image of metal thickness from pad sensors. These measurements use the same low-frequency transmitter as the average EM thickness measurement. In multiple-string casing designs, the pad sensors respond to metal loss in all strings (limited by their signal-to-noise ratio (SNR) limit) but they are most influenced by the innermost string. Generally the sensitivity decreases with radial distance from the sensor. The average metal thickness measurement is derived from impedance phase shifts. It can be normalized by subtracting the average of all eighteen image measurements at that depth to enhance azimuthal variations and suppress overall casing variations, for example due to casing joints or collars.

Near-Field.

3. High-resolution internal defect image. High-frequency signals barely penetrate into the metal of the tubular, so the inner surface of the tubular strictly determines the near-field signal response, immediately adjacent to the pads. Hence, a response on the 2D thickness image but not on the 2D discrimination image is interpreted as originating from the outer wall of the casing because there is no response on the inner wall of the tubular. The 2D discrimination image can be normalized by subtracting the azimuthal average.

4. Averaged inner diameter ID and impedance property $\sqrt{\mu/\sigma}$ of the pipe made with a separate transmitter and two closely spaced receiver coils. This measurement uses three frequencies between 100 Hz and 100 kHz.

The image measurements (2 and 3) use eighteen radially mounted pad sensors (**Fig. 4**) that are kept pressed against the inside wall of the casing. This cage mounting largely keeps all pads at equal radii as the cage expands and collapses. When the imaging cage is fully collapsed it has a minimum diameter of 2.3-in. The pad sensors respond to a 1-in. diameter region of the casing. There is significant overlapping of the pad response region for small pipe diameters. As the cage expands the overlap diminishes such that at a well inner diameter of approximately 6-in. the responses provide for 100% non-overlapping coverage of the inner wall. For larger diameters up to the maximum cage-expansion diameter of 9-in. the coverage is proportionately less. For wells with larger outer diameter (OD) the imaging is unreliable because the sensors are at unknown standoffs from the inner wall. **Fig. 5** shows a schematic of the new logging tool with its measurement sections.

Remote-Field Eddy-Current (RFEC) Regime and EM Thickness Measurement.

The new tool uses sufficiently low frequencies and large separations L between Tx and Rx to measure the mutual impedance and to extract the ratio of wall thickness (t) of the pipe to skin-depth (δ), called the EM thickness (t/δ). We subsequently discuss in more detail what frequencies $f = \omega/2\pi$ and separations L meet these requirements. The skin-depth δ is defined by

$$\delta = \sqrt{\frac{2}{\sigma\,\mu\,\omega}} \tag{2}$$

where μ is the magnetic permeability and σ the electrical conductivity of the pipe. The magnetic permeability is typically expressed as a unitless quantity μ_r relative to its vacuum value $\mu_0 = 4\pi\times10^{-7}$ V·s/(A·m); i.e., $\mu = \mu_r\mu_0$. The skin-depth in the cylindrical geometry is the penetration depth of the eddy-currents and EM fields in the metal corresponding to an attenuation to a fraction of $1/\mathrm{e} \approx 37\%$.

The large skin-depth regime is characterized by a skin-depth δ of the same order of magnitude as the pipe thickness t. Thus EM fields can traverse the pipe wall thickness and radiate into the region outside the pipe (or outermost pipe for the case of multiple strings). The range of the pipe's EM parameters are empirically determined to $3.9 \cdot 10^6\ \mathrm{siemens/m} \leq \sigma \leq 7.4 \cdot 10^6\ \mathrm{siemens/m}$ and $20 \leq \mu_r \leq 200$ whereas typical single oilfield tubulars have a thickness range of 0.2-in. $\leq t \leq$ 0.9-in. and a range of inner diameters ID of 2.4-in. $\leq$ ID $\leq$ 10-in. Operating in the large skin-depth regime requires low excitation frequencies, below 100 Hz.

Fig. 3 illustrates how the Tx-Rx spacing L affects the measurement. The total magnetic field in the casing consists of three contributions. Near the transmitting coil ($z \approx 0$) the first contribution is the free-space field. This field decreases with z and at a distance $z \gg a_1$ is proportional to z^{-3}. In the pipe wall the induced eddy-currents produce a secondary magnetic field opposing the free-space field. The sum of these two contributions, the direct-coupling field, is weak and decays exponentially as function of z. This direct-coupling field does not contain any information about the pipe thickness.

In contrast, a third contribution to the total field, called the indirect-coupling field, is highly sensitive to the wall thickness. This field is dwarfed by the direct-coupling at short Tx-Rx separations. It is rather weak due to high attenuation of EM waves propagating in a metal and therefore requires the low excitation frequencies mentioned earlier. The indirect-coupling field decays more slowly as function of z compared with the exponential decay of the direct-coupling field. For a Tx-Rx sensor spacing range of approximately $L/(2a_1) \geq 2.5$ the indirect-coupling becomes comparable with or larger than the direct-coupling. This distance corresponds to the 'remote-field' operating regime in which the phase changes $\Delta\varphi$ of the mutual impedance measurement become a nearly linear function of the pipe EM thickness (Gianzero 1984). It turns out that to first order the mutual impedance is proportional to the complex propagation factor $exp(-2\,k\,t)$, with a complex wave vector $k = (1-i)/\delta$. In particular, the phase changes are given by

$$\Delta\varphi = 2\,t/\delta = 2t\sqrt{(\sigma\mu\omega)/2} \tag{3}$$

In this regime the indirect coupling between transmitter and receiver contributes one phase shift of t/δ by the field that has penetrated the pipe outward into the external medium near the transmitter, propagated along the outermost interface nearly dipole-radiation-like, and finally reentered inward across the pipe near the receiver, picking up a second phase shift t/δ. The measured phase shifts $\Delta\varphi$ are inverted for the EM thickness of the pipe. The practical upper limit of $L/(2a_1)$ is a function of the measurement SNR. More generally, the mutual impedance can be written as

$$Z = \frac{e^{-2\,k\,t}}{L^3}\,g(t/\delta\,, a_1, L, b_1, b_2).$$

The dominating exponential has been separated. Additional corrections in the function g depend on the tool geometry and the casing properties. Both amplitude attenuation and phase shifts are characterized by the same quantity $2\,t/\delta$. The low-frequency used for the RFEC measurements is selected to optimize the SNR, thickness resolution, and axial resolution for a given condition. Higher frequencies would see more attenuation, whereas lower frequencies are less sensitive to the casings. For a typical 7-in. casing, a frequency choice of 35 Hz gives near-optimal SNR. Lower frequencies are used to log thick casings or multiple casings.

In the RFEC regime the mutual-impedance phase measurement is sensitive only to the total metal thickness in the path of the EM field between the transmitter and receiver. Thus this measurement detects flaws on the inside and on the outside of a pipe and cannot distinguish the two cases. Once a localized flaw is detected, its placement on the inside or outside of the joint requires the discrimination measurement (see below). The smallest detectable size of a metal loss area depends on the spatial response of the receiver and transmitter solenoids. Long, axial solenoid sensors provide an averaging RFEC response and are suitable only for large-scale or general metal loss. On the other hand, small solenoid sensors located near the inner pipe perimeter identify localized defects and a combination of several such sensors (pads) provide an azimuthally resolved RFEC EM thickness image.

Even if multiple pipes are present the measurement still provides the total EM thickness, associated with the combined metal pipe thicknesses as long as the field that penetrated all the layers can be detected with sufficient SNR. Comparisons between logs run at different times (time-lapse) can thus provide information on gradual metal loss of the combined pipes and a measurement of a corrosion rate. Small localized flaws, however, can generally only be detected by imaging sensors if they are situated on the innermost pipe; otherwise the standoff between sensor and flaw becomes too large washing out the effects of the field perturbations by the defect.

While a given oilfield tubular grade may have a nearly constant electrical conductivity σ throughout the pipe joint, the generally ferromagnetic casings exhibit varying and unknown values of magnetic permeability μ, which also vary locally along a given joint. As a result the apparent EM thickness may exhibit significant variations along a given joint, which could be due to variations of the pipe thickness t or the magnetic permeability μ or both (see equation (3)). The RFEC measurement alone is insufficient to distinguish between one and the other. This magnetic anomaly effect must be separately corrected as discussed below.

Near-Field Eddy-Current Regime.

The small skin-depth regime has a skin-depth much smaller than the pipe thickness $t/\delta \gg 1$. In this high-frequency case the EM fields cannot penetrate far into the innermost pipe wall and measurements become independent of the pipe thickness, thus simplifying the tool response. The new EM inspection tool employs multiple high-frequencies (HF) in the range of 100 Hz ≤ HF ≤ 100 kHz.
Due to the small skin-depth limit the pipe can be approximated by an infinitely thick pipe and the problem considers only two regions, inside the pipe for $r \leq a_1$ and inside the pipe metal for $r > a_1$. The behavior of the impedance Z depends significantly on the dimensionless variable τ:

$$\tau = \frac{1}{\mu_0 \mathrm{ID}} \sqrt{\frac{\mu}{\omega\sigma}} \ .$$

The use of relatively high excitation frequencies strongly attenuates the receiver signal as function of transmitter-receiver spacing L and therefore necessitates sufficiently small sensor spacing $L/(2a_1) < 1$ referred to as the high-frequency near-field eddy-current (NFEC) regime. Measurements in the NFEC regime are used to simultaneously invert for the average ID and average ratio μ/σ. The average ratio μ/σ can be employed to correct for the magnetic anomaly effect discussed previously. It effectively eliminates the variable μ and leaves only the pipe conductivity σ as user-adjustable parameter. The frequencies and spacings used for the NFEC measurement are chosen to yield optimum sensitivity to the quantities ID and μ/σ for a particular range of casing inner diameters. In general, a small spacing is more favorable to invert for small casing ID, while a large spacing is more favorable to invert for large casing inner diameters. Note that the concept of correcting the EM thickness measurement for magnetic anomalies by an independent μ/σ ratio measurement can only apply to a single-casing completion. The RFEC EM thickness measurement in multiple casings cannot be satisfactorily corrected in this way and remains a qualitative measurement.

For the new tool, NFEC measurements are also employed to perform the discrimination imaging measurement. At high frequency the pad sensor response is very sensitive to the standoff from the metal surface. Defects seen on the images with both a RFEC response and a NFEC response necessarily occur on the inner surface, whereas RFEC responses without NFEC response are caused by metal-loss on the pipe exterior.

Both the high-frequency NFEC discrimination and the low-frequency RFEC EM thickness are imaging measurements that require receivers located close to the inner casing perimeter. Eighteen sensors are mounted on suitably designed centralizer arms (**Fig. 4**) to ensure a small standoff between the receiver and the inner casing surface for the desired range of casing ID.

Field Examples

The examples comes from a test well in France with two casing strings. The outer 9 5/8-in. OD casing extends from the surface to a depth of 404 m, and an inner 7-in. OD casing from surface to a depth of 1145 m. **Fig. 6** shows a typical EM log presentation obtained from the single casing section. The leftmost panel shows a cross section of the interpreted casing dimensions, with the measured inner radius shown as the solid line on the left edge of the shading. This radius was determined from the averaged NFEC measurement. The shading width is determined from the EM thickness response of the average RFEC measurement for a fixed casing conductivity. The right edge of the shading is thus the inferred outer radius of a single casing. The casing collars show up as extra thickness, making the interpreted OD spikes to the right. There are three prominent sections of heavier weight casing seen at depths of 500 m, 650 m, and 680 m, identified by the decrease in inner radius and increase in shading (metal thickness). There is also a thinning feature seen at 830 m on this panel which is discussed later in a depth-zoomed plot.
The second panel from the left displays the metal loss in percent, calculated from nominal thickness versus measured metal thickness. It is generally insignificant except for an interesting feature at 830 m, where there is a short section showing 100% metal loss. The next panel is a high-resolution image of the metal thickness seen by each pad with the mean value of all pads removed at each depth to enhance the azimuthal display sensitivity. The next panel is the high-resolution discrimination image (in yellows and black) of the inner surface of the pipe made using the NFEC pad measurements. A linear feature shows up at various depths winding its way around the display as the tool rotates. This feature is a cable groove that was worn into the casing through many years of running wireline tools in the hole. The next panel shows the signal amplitude level of the low-frequency receiver coils. Attenuation increases as the EM signal encounters larger metal thickness; consequently the receiver coils measure a weaker signal amplitude. This signal loss reduces the SNR, yielding lower-quality data. Signal quality generally becomes a concern with more than –40 dB of attenuation, typically corresponding to passing through an inch of metal thickness twice (once outward near the transmitter and once more inward toward the receiver).

Fig. 7 compares the EM thickness for a fixed pipe conductivity in a single-casing section to the thickness measured by an ultrasonic logging tool. The two thickness measurements agree well with differences between 1% and 5%. The ultrasonic logs also show a thinning of the casing at the collars, because the threads create complex reflections, masking the extra metal

collar. Here, the small variation can be due to slight variations of σ and μ along the string. The thickness interpretation assumes constant μ and σ, such that the thickness matches for uncorroded sections.

Fig. 8 shows a zoom around the feature at 830 m. Here a 3 m zone shows metal loss reaching 100%. The log quality attenuation display also indicates no attenuation. The high-frequency image shows a pronounced widening of the groove feature. This zone is interpreted as a section where a crack has split the metal below the groove to the outside of the casing, breaching the hydraulic integrity. The standard ultrasonic thickness log as in **Fig. 7**, is unable to detect the crack in the casing because it is masked by the cable groove. This ability to detect splits in the casing can be critical for well remediation decisions.

There are several regions of the cable groove feature that illustrate other concerning signs of wear. For example **Fig. 9** shows a depth zoom at about 577 m. Here the metal loss appears increased and the high-frequency image clearly shows the groove. A 5 m zone of metal loss shows up on the high-frequency image and the metal loss curve alerts the operator to casing weakness.

The importance of the corrosion log was made quite clear during the tool validation-testing in this well. The normal testing procedure for these tools was to log a short section around the single to double casing to validate the operation of each new tool over known features. Generally the rest of the well was not logged. In July 2010 one of the tools became stuck in the well very near the surface. Upon subsequent examination of the well with a borehole camera it was discovered that the inner casing had buckled in this area. **Fig. 10** includes a log made in spring 2010 that logged all the way to the surface. Problems with the well are clearly evident. The inner diameter of the well increases from 6.4-in. to about 7-in. going up from 65 m depth. The metal loss and attenuation curves reflect this increase. The middle panel of thickness minus its average exhibits significant noise as the image in multiple casings is generally of poor quality and requires slow, steady logging speeds. The combination of increasing inner radii and increasing metal loss tracks the combination of the increasing groove depth from cable wear and corrosion from water table movement over more than 30 years of operation, which badly damaged the internal casing.

The well was repaired at the end of 2010 by inserting 67 m of expandable thin casing in the well. EM corrosion logs from April 2011 are included in **Fig. 10**. The liner is made of thin steel, which has a significantly larger skin-depth than standard oilfield tubular steel. The inner diameter measurement clearly shows the change to the new liner with the radius reduced at a depth of 67 m to about 6-in. The metal loss measurement is essentially unchanged as the new liner adds only $t = 0.01$-in. of equivalent oilfield tubular steel thickness. The high-frequency image shows a fairly homogeneous zone through the patched section.

Conclusions

A new electromagnetic casing inspection tool has been introduced. It delivers average metal loss and azimuthally resolved casing imaging measurements in any fluid or gas environment. The slim design allows for inspection in multiple casings through the tubing or below the tubing. Total metal thickness variations can be quantified in pipes with outer diameters from 2 ⅞-in. to 13 ⅜-in. EM caliper measurements are performed in the inner diameter range of 2 ⅞-in. to 7-in., covering most typical pipe sizes. The detection and characterization of corrosion and wear has been demonstrated in a number of field trials through the combination of total metal thickness, inner diameter, and high-resolution metal loss imaging, enabling operators to better plan intervention and mitigation strategies.

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Nomenclature

a_m	*inner radius of medium m (meter)*
a_1	*casing inner radius (meter)*
a_2	*casing outer radius(meter)*
b_1	*transmitter coil radius (meter)*
b_2	*receiver coil radius (meter)*
f	*frequency (hertz)*
i	$i = \sqrt{-1}$ *imaginary unit*
k	*complex wavenumber (1/meter)*
k_m	*complex wavenumber of medium m (1/meter)*

m	*index of medium*
n	*number of media*
r	*radius (meter)*
t	*casing thickness (meter)*
z	*distance along borehole axis (meter)*
$H_z(z,r)$	*z-component of the magnetic field (ampere/meter)*
I	*current (ampere)*
$I_\alpha(z)$	*modified Bessel function of the first kind (order α)*
$K_\alpha(z)$	*modified Bessel function of the second kind (order α)*
L	*transmitter-receiver spacing (meter)*
T	*time (second)*
V	*voltage (volt)*
Z	*complex impedance (ohm)*
Z_p	*complex impedance contribution due to cylindrical interfaces (ohm)*
Z_0	*complex impedance contribution in free-space (ohm)*
β_m	*complex separation variable in medium m (1/meter)*
δ	*skin-depth (meter)*
ε_m	*permittivity of medium m (ampere-second/volt-meter)*
λ	*variable of integration (1/meter)*
μ	*magnetic permeability (volt-second/ampere-meter)*
μ_m	*magnetic permeability of medium m (volt-second/ampere-meter)*
μ_r	*relative magnetic permeability*
μ_0	*magnetic permeability of vacuum $\mu_0=4\pi\times10^{-7}$ (volt-second/ampere-meter)*
σ	*electrical conductivity (siemens/meter)*
σ_m	*electrical conductivity of medium m (siemens/meter)*
τ	*real and dimensionless variable*
φ	*phase of normalized remote field measurement (radian)*
ω	*angular frequency (radian/second)*
$\Delta\varphi$	*phase change (radian)*
$\Gamma_m^{(n)}$	*m-th reflection coefficient for n media*
Φ	*magnetic flux (volt-second)*

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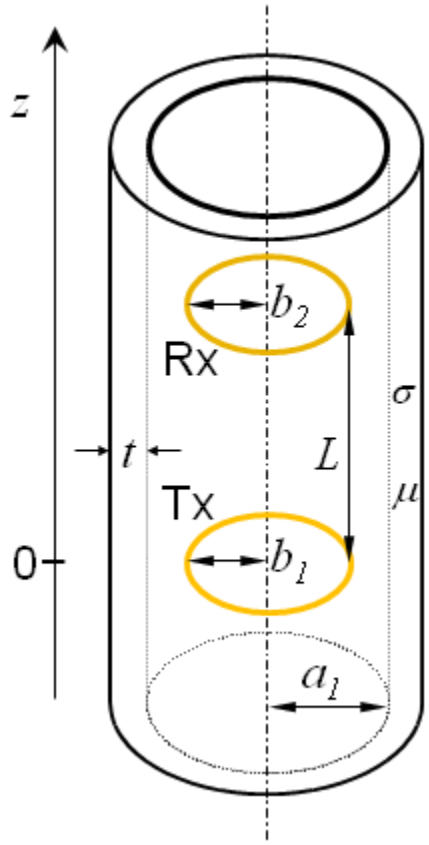

Fig. 1—Schematic geometry of a tool transmitter (Tx) located at z = 0 with radius b_1 and receiver (Rx) with radius b_2, separated by a spacing L. The tool is situated inside a ferrous tubular with inner radius a_1 and thickness t. The electromagnetic properties of the tubular are described by an electrical conductivity σ and a magnetic permeability μ.

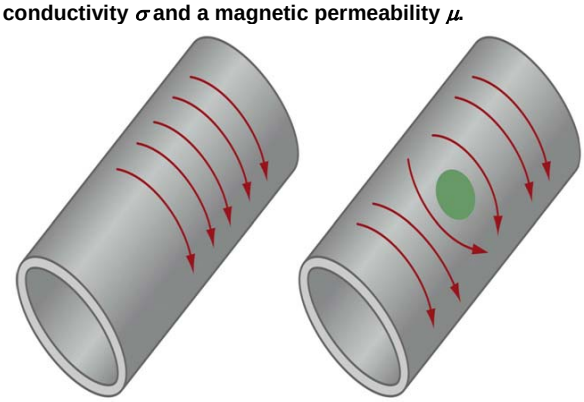

Fig. 2—Schematic of induced eddy-currents in an uncorroded casing (left) and disturbed current flow around a defect (right).

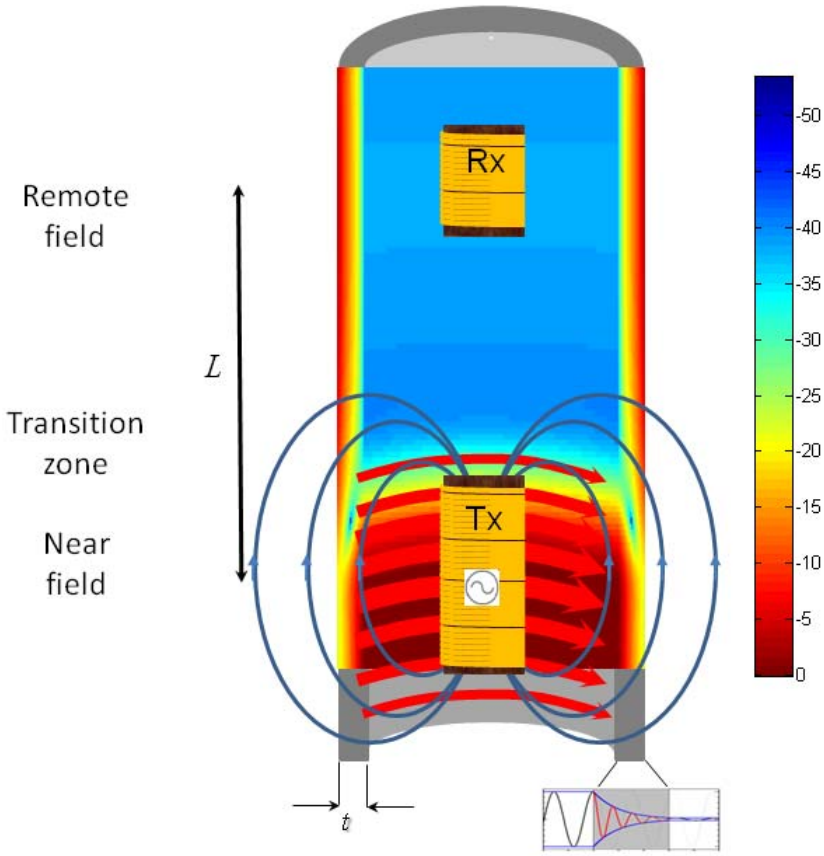

Fig. 3—Schematic representation of three field regimes around the transmitter: near-field, transition zone and remote field (Acuña 2010). The cylindrical pipe (gray) is characterized by an outer diameter of 7-in., an inner diameter of 6.37-in., an electrical conductivity σ =5×10^6 siemens/m and a relative magnetic permeability μ_r = 95. The electrical field at 10 Hz generated in the pipe by a solenoidal Tx is indicated by the color map on a logarithmic scale. Magnetic field lines around the transmitter Tx (blue) and eddy-current flow lines within the metal (red arrows) are shown schematically. The color map indicates the attenuation of the magnetic field inside the metal pipe as a function of distance from the transmitter. The radial variation of the magnetic field within the pipe metal thickness is equally indicated. Note that the magnetic field exhibits a slowly decreasing behavior in the remote-field zone for $L/\mathrm{ID} \geq 2.5$ whereas it decreases rapidly in the transition zone. The small inset at the bottom right illustrates schematically the exponential attenuation of the alternating EM field traversing the metal pipe outward near the transmitter in the near-field zone.

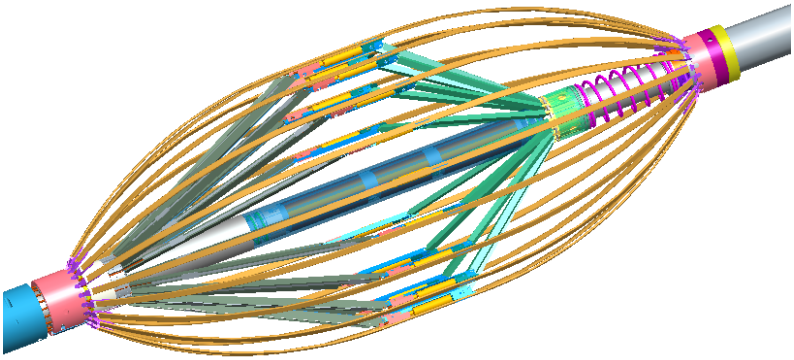

Fig. 4—Drawing of the imaging section showing the structure of 18 compliant arms holding the pad sensors. The image sensors (yellow) are located at the middle of each arm to ensure good contact with the inner perimeter of a pipe during logging. Additional receivers are mandrel-mounted in the center of this section.

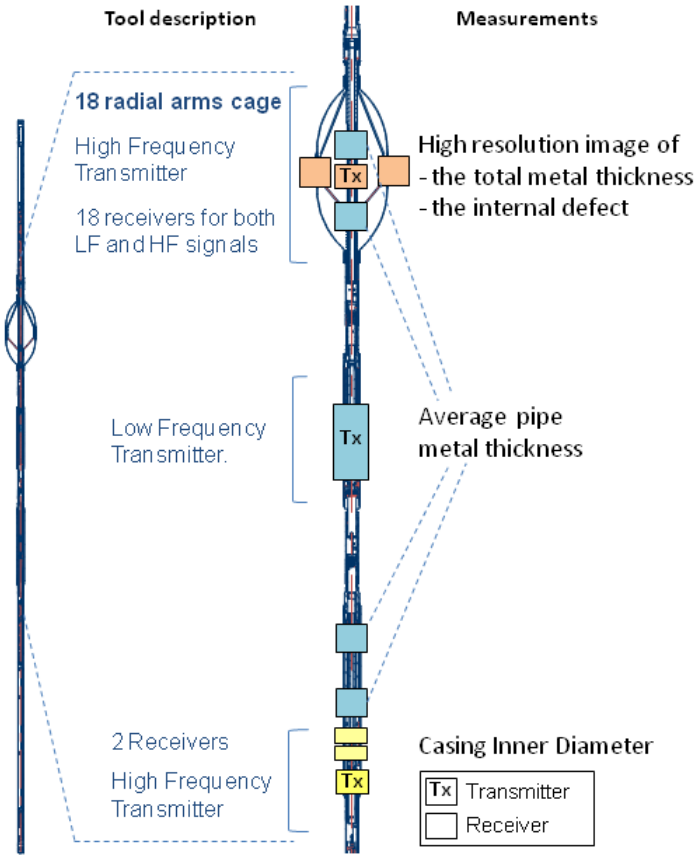

Fig. 5—Schematic drawing of the new imaging tool. The overall length is 6 m and the outer diameter is 2.2-in. The two pairs of mandrel-mounted low-frequency (LF) receivers arranged equidistantly above and below the LF transmitter are referred to as double coils.

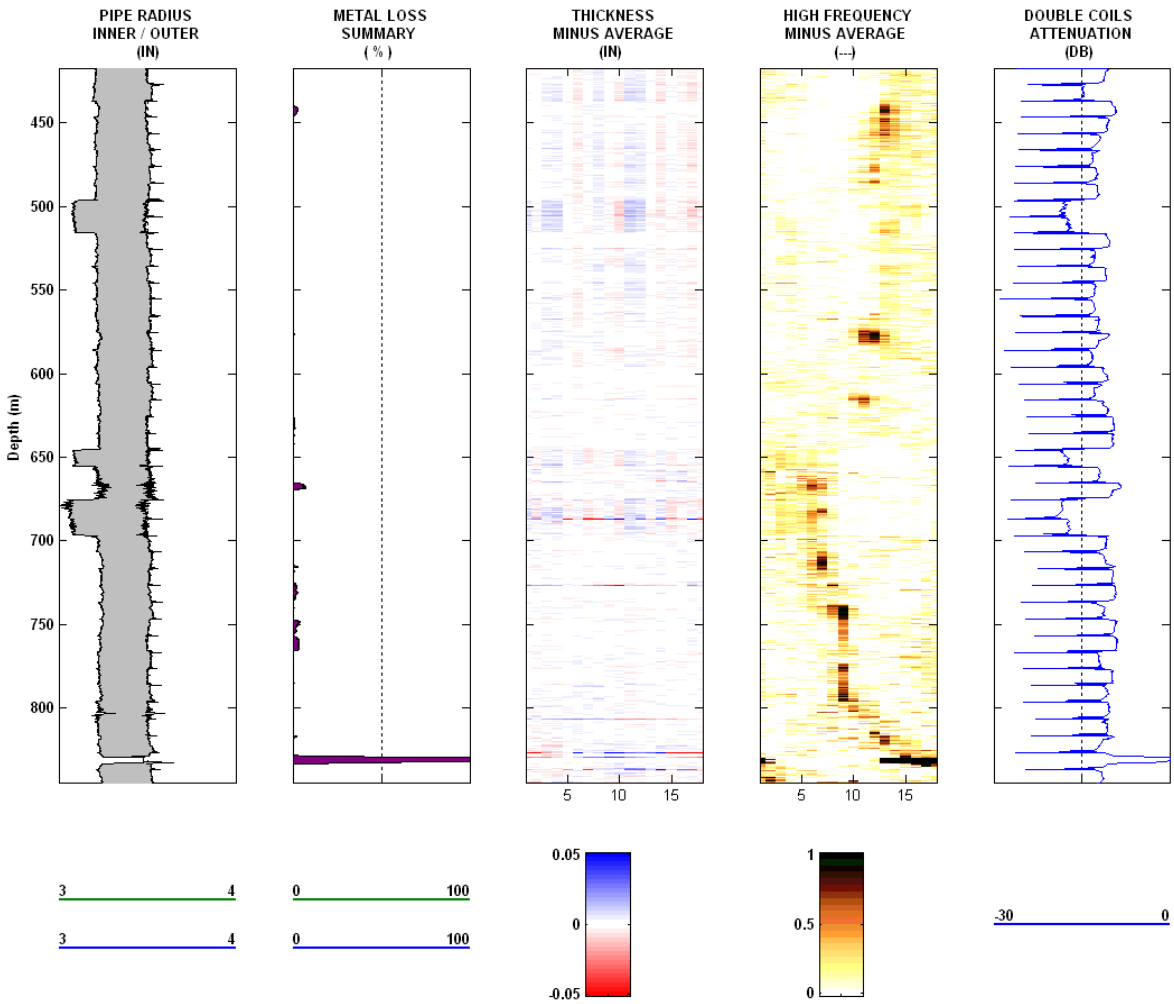

Fig. 6—Log display from part of a single-casing section. In the left panel the leftmost edge of the grey shaded region corresponds to the average inner radius determined from the high-frequency NFEC measurement. The average EM thickness measurement is used in combination with the casing electrical conductivity σ to determine the thickness of the casing. This is represented by the shaded area in the left panel. The regularly spaced spikes represent the additional thickness of the casing collars. The second panel displays the metal loss in percent, which is generally insignificant except at about 830 m, where there is a short section of 100% metal loss. The third panel shaded in blues and reds is the low-frequency image of variations of local metal thickness around the azimuthal average. The fourth panel shows the high-frequency image of variations around the azimuthal average showing the presence of a cable groove. The final panel on the right is used for data quality control. It shows the amount of average low-frequency attenuation as measured by one of the RFEC receivers (double coils).

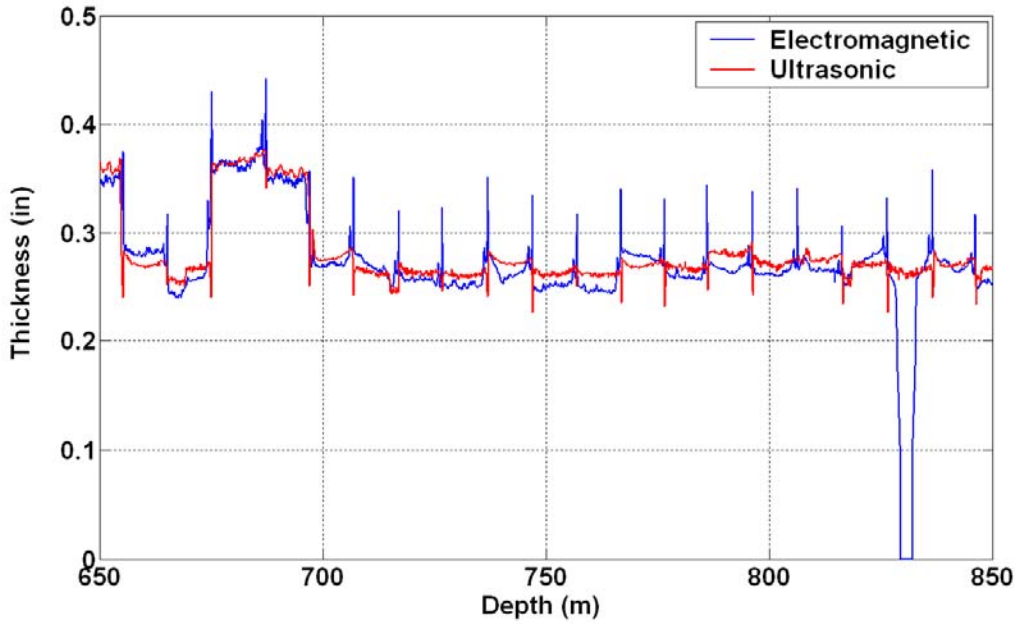

Fig. 7—Thickness comparison of ultrasonic and EM measurements in the same test well. Very good agreement is observed except for the section near 830 m, where the EM thickness drops to zero while the ultrasonic response stays constant. The EM measurement has detected a crack or split in the casing beneath a cable groove.

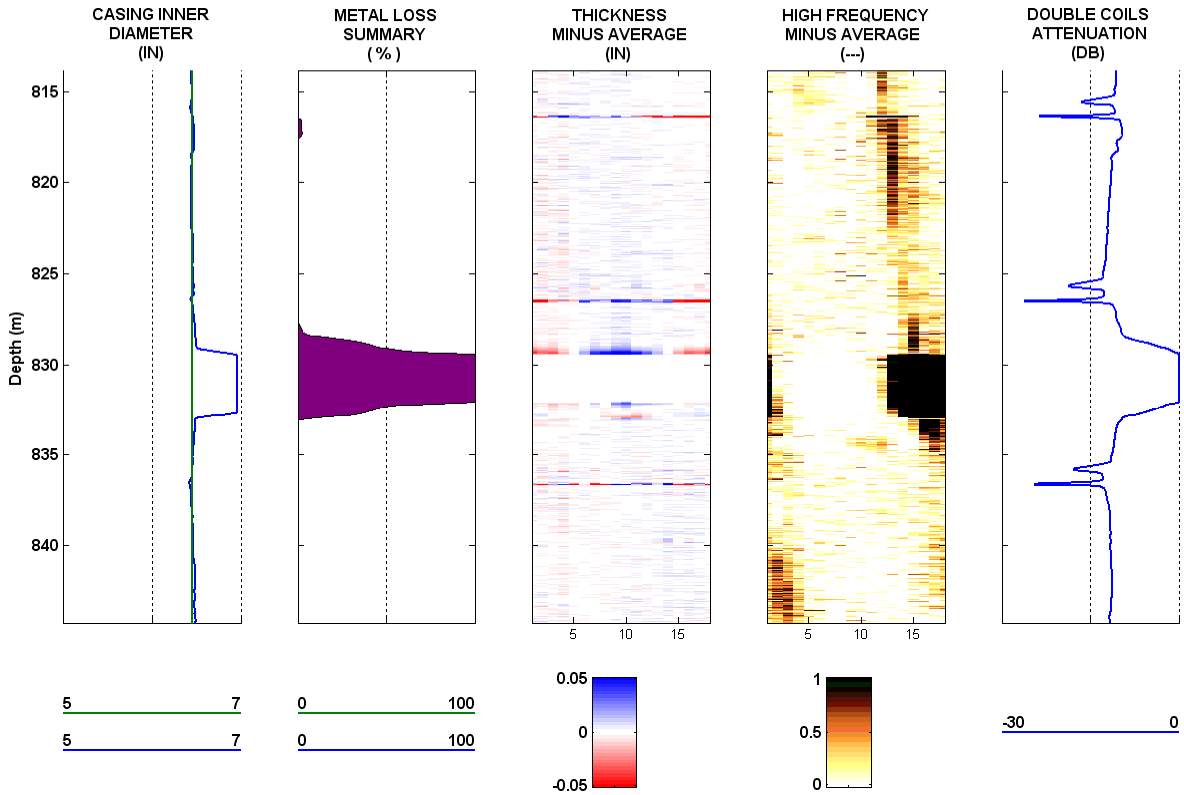

Fig. 8—Log display zoomed in around the anomalous zone at 830 m. Here a 3 m length of casing shows metal loss reaching 100%. The high-frequency image in the fourth panel shows a pronounced widening of the groove feature here. The low-frequency attenuation display in the rightmost panel reaches zero. This zone is a section where the groove has split through to the outside of the casing, breaching the hydraulic integrity.

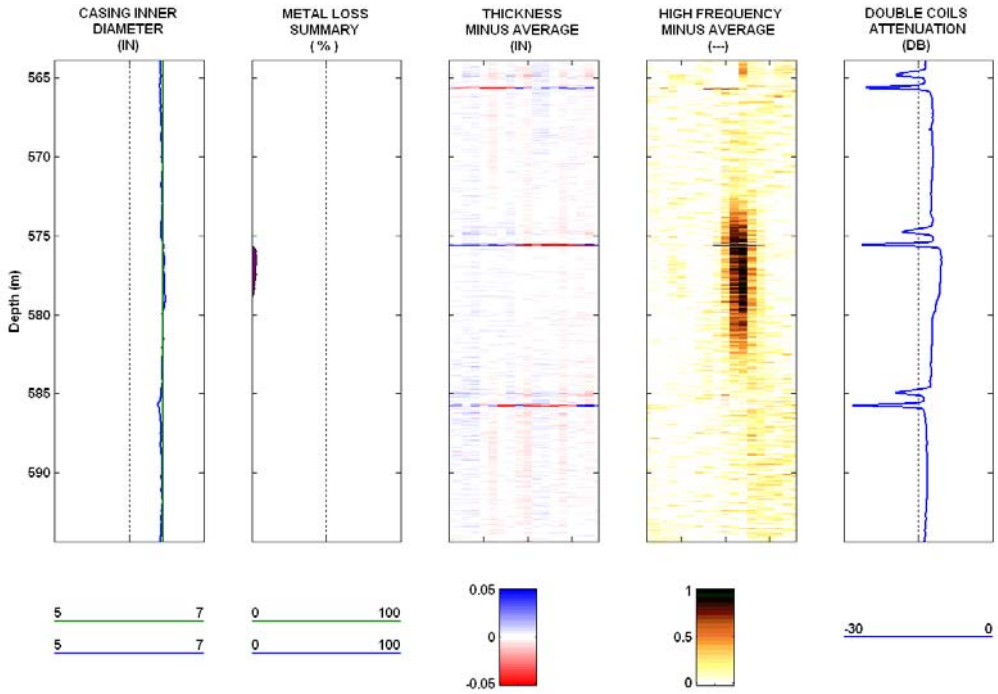

Fig. 9—Log display zoomed in around a zone with metal loss near a depth of 577 m. The loss is due to a groove caused by wear from a wireline cable. The second panel indicates a small metal loss by the average measurement. This is reflected by the decreased amplitude attenuation of the RFEC signal in the right panel. The fourth panel displays the high-frequency image of variations around the azimuthal average showing the presence of the cable groove on the inside of the pipe. The vertically elongated nature of the groove renders it difficult to detect on this low-frequency image.

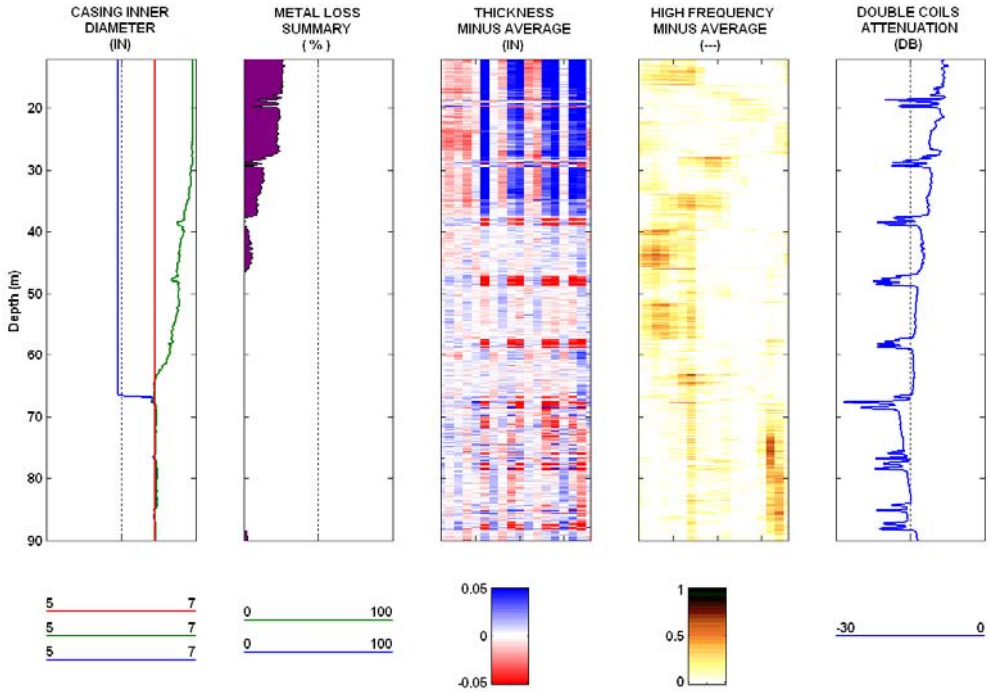

Fig. 10—This log was run in a test well with double-casing configuration (outer diameters of 7-in. inside 9 5/8-in.). It shows an increasing inner radius (green curve in first panel) of the inner pipe, increasing total metal loss (purple shading in second panel), and decreasing low-frequency attenuation (blue curve in right panel) near the top of the well. This zone of metal loss eventually buckled and had to be repaired. The repaired test well shows the new expanded liner patch, which extends to 67 m. The inner radius of the new liner is indicated in the first panel in blue. No significant extra metal is detected on the metal loss because a low magnetic permeability and low conductivity steel was used as liner material. The thickness image is affected by some noise in this double-string section and the high-frequency image in the repaired liner is rather featureless.

Appendix: EM Fields in Multi-Cylindrical Media

The general schematic considered for EM measurements in the oilfield geometry, with a logging tool centered inside a cylindrical pipe, is illustrated in **Fig. 1**.

Both conductivity and permeability are treated as linear and isotropic for a given medium. For the averaged measurements, the problem can be simplified to a one-dimensional EM problem by assuming azimuthal symmetry and infinitely long pipes along the z direction. The EM fields are excited by air-cored axially symmetric solenoids (described by superposition of filamentary current loops of radius b_l). The analytic solution for this geometry for an arbitrary number of cylindrical conductors with arbitrary thickness, permeability, permittivity, and conductivity was discussed (Dodd 1974). More recently, semi-analytical solutions for finite-length cylindrical or eccentric structures have been presented (Skarlatos 2010; Theodoulidis 2008) whereas fully numerical solutions are typically required for the 3D problems associated with imaging. The specific case of RFEC inspection of ferrous metallic pipes was originally patented in 1951 (MacLean 1951) and comprehensive analyses have been presented (Haugland 1996). Discussions of the specific application of RFEC to the non-destructive evaluation of oilfield tubulars can be found in several papers (Gianzero 1984; Marinov 1986; Schmidt 1989).

For the axially symmetric solution in each medium (**Fig. 1**) the response function of each medium n is characterized by a complex wave vector

$$k_m = \sqrt{i\omega\sigma_m\mu_m + \varepsilon_m\mu_m\omega^2}$$

where the index refers to the media $m = 1, \dots, n$. For the special case of a single pipe $n = 3$. The pipe conductivity is of the order of $\sigma = 5 \cdot 10^6$ siemens/m and the magnetic permeability of ferromagnetic pipes is of the order of $\mu = 100\mu_0$ where μ_0 is the vacuum permeability inside and outside the pipe. For typical operating frequencies of 10 Hz to 50 kHz, the permittivity term $\varepsilon_m\mu_m\omega^2$ can be safely neglected leading to a low-frequency approximation for the wavevector as $k_m \approx \sqrt{i\omega\sigma_m\mu_m}$

The voltage induced in the receiving Rx loop can be calculated from

$$V = -\frac{d\Phi}{dT} = -i2\pi\omega\mu_0 \int_0^{b_2} dr\, rH_z(z,r)$$

where $H_z(z,r)$ is the z-component of the magnetic field at the Rx loop position. It is proportional to the Tx current I. The mutual impedance $Z = V/I$ between the receiver voltage V and the transmitter current I can be expressed as a sum of two Fourier integrals $Z = Z_0 + Z_p$ where the first term Z_0 is the free-space term corresponding to an unbounded single medium

$$Z_0 = \begin{cases} 2i\omega\mu_1 b_1 b_2 \int_0^\infty d\lambda I_1(\beta_1 b_1) K_1(\beta_1 b_2)\cos(\lambda L), b_1 \le b_2 \\ 2i\omega\mu_1 b_1 b_2 \int_0^\infty d\lambda I_1(\beta_1 b_2) K_1(\beta_1 b_1)\cos(\lambda L), b_1 > b_2 \end{cases}$$

while the second term Z_p incorporates the effects due to the presence of one or more cylindrical interfaces

$$Z_p = 2i\omega\mu_1 b_1 b_2 \int_0^\infty d\lambda I_1(\beta_1 b_1) I_1(\beta_1 b_2)\Gamma_1(\lambda)$$

Here the separation variable is $\beta_m = \sqrt{\lambda^2 - k_m^2}$, λ is the Fourier transform variable (and also the axial wavenumber) and $\Gamma_1(\lambda) = \Gamma_1^{(n)}(\lambda)$ is a reflection coefficient and depends on the number of media n (and interfaces $n-1$). It is determined from the recurrence relation for all media $m = 1, \dots, n$

$$\frac{\mu_m}{\beta_m}\frac{\Gamma_m(\lambda)I_1(\beta_m a_m) + K_1(\beta_m a_m)}{\Gamma_m(\lambda)I_0(\beta_m a_m) - K_0(\beta_m a_m)} = \frac{\mu_{m+1}}{\beta_{m+1}}\frac{\Gamma_{m+1}(\lambda)I_1(\beta_{m+1} a_m) + K_1(\beta_{m+1} a_m)}{\Gamma_{m+1}(\lambda)I_0(\beta_{m+1} a_m) - K_0(\beta_{m+1} a_m)}$$

where for the outermost medium $\Gamma_{m=n}^{(n)} = 0$. Note that $I_\alpha(z)$ and $K_\alpha(z)$ are modified Bessel function of the first and second kind, respectively. The integration path of the integrals above lies in the complex λ plane and includes singularities. It has been shown in general (Chew 1983) that the only singularities in the complex λ plane are the branch-point singularity associated with the outermost medium which extends radially to infinity, and pole singularities which correspond to discrete waveguide modes in the multi-cylindrical medium. Typically these waveguide modes are strongly damped—an effect similar to the propagation of microwaves in a waveguide at frequencies lower than the so-called cutoff frequency. The branch-point singularity corresponds to the lateral wave which travels from the transmitter outward through the layers to the outermost medium, propagates along the outermost interface with relatively little attenuation and finally travels inward toward the receiver. Lateral waves play a key role in the RFEC measurement regime because they are sensitive to the total thickness of the pipes (Haugland 1996). Due to the eddy-current damping in the ferrous tubular, operation in this RFEC regime requires the skin-depth to be comparable with or larger than the total thickness of the pipes. This can only be achieved at sufficiently low frequency of operation.

It is convenient to use dimensionless variables to classify the response of the pipe to the various sensor geometries and frequencies. Apart from the EM thickness t/δ introduced before, it is furthermore useful to define the dimensionless quantity $L/(2a_1)$ describing the sensor spacing relative to the pipe inner diameter. Finally we may define a real and dimensionless variable τ as

$$\tau = \frac{1}{\mu_0 \mathrm{ID}}\sqrt{\frac{\mu}{\omega\sigma}}$$

where $\mathrm{ID} = 2a_1$ is the inner diameter of the casing. Note that the quantity τ depends on the two typically unknown quantities ID and the ratio μ/σ.

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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

Pre-Formal Inquiry into California Gas Management, Practices and Procedures Related To The Aliso Canyon Incident in October, 2015.

EXAMINATION UNDER OATH OF JAMES MANSDORFER

REPORTER'S TRANSCRIPT
Los Angeles, California
September 13, 2018
Pages 1 - 154

Reported by: Andrea Ross, CSR No. 7896
Rebekah DeRosa, CSR No. 8708

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1 **THE PUBLIC UTILITIES COMMISSION**
OF THE
2 **STATE OF CALIFORNIA**

3

4 PRE-FORMAL INQUIRY INTO SOUTHERN CALIFORNIA
GAS COMPANY'S MANAGEMENT, PRACTICES AND
5 PROCEDURES RELATED TO THE ALISO CANYON
INCIDENT IN OCTOBER, 2015.
6

7 **Appearances:** (Examination Under Oath,
September 13, 2018)
8

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28

1 BE IT REMEMBERED THAT, by Subpoena of the
2 Witness, and on Thursday, September 13, 2018,
3 commencing at the hour of 10:10 a.m. thereof,
4 at the offices of the CALIFORNIA PUBLIC
5 UTILITIES COMMISSION, 320 West Fourth Street,
6 Fifth Floor Law Library, Los Angeles,
7 California, 90013, before ANDREA L. ROSS, CSR
8 No. 7896 and REBEKAH L. DEROSA, CSR No. 8708
9 personally appeared:
10 **JAMES MANSDORFER,**
11 called as a witness herein, who, having been
12 previously sworn, was thereupon examined and
13 interrogated as hereinafter set forth.
14 * * * * *
15 MR. GRUEN: If we could, as a first
16 order of business, let's go around the room,
17 state and spell our names for the record and
18 our titles today, if applicable. I'll start.
19 My name is Darryl Gruen, D-a-r-r-y-l,
20 G-r-u-e-n. I'm a staff attorney for the
21 California Public Utilities Commission, and I
22 am representing the Safety and Enforcement
23 Division, Gas Safety and Reliability Branch
24 today.
25 MR. HOLTER: My name is Randy Holter,
26 R-a-n-d-y, H-o-l-t-e-r, Senior Utilities
27 Engineer Specialist and with the Gas Safety
28 and Reliability Branch.

1 MR. GRAVELLE: Doug Gravelle,
2 G-r-a-v-e-l-l-e. I'm an attorney for
3 Mr. Mansdorfer.
4 THE WITNESS: James, I go by Jim
5 normally, Mansdorfer, M-a-n-s-d-o-r-f-e-r.
6 MR. GRUEN: Thank you.
7 EXAMINATION
8 BY MR. GRUEN:
9 Q Mr. Mansdorfer, you are here under
10 subpoena. I will hand to you a copy of the
11 subpoena and ask if that looks like a true
12 and accurate copy of the subpoena that you
13 received to appear today?
14 A Yes.
15 Q Do you want to take a look at the
16 rest of the pages? You don't have to, but --
17 A I've seen it before.
18 Q Very good.
19 MR. GRAVELLE: Excuse me. Do you
20 intend to mark these as exhibits?
21 MR. GRUEN: Yes, I do.
22 MR. GRAVELLE: All right.
23 MR. GRUEN: That was the next order of
24 business. Do you want to take a look?
25 MR. GRAVELLE: No.
26 MR. GRUEN: And, indeed I will ask that
27 this be marked as Exhibit 1, please.
28 (Exhibit No. SED-01 was marked for identification.)

1
2 MR. GRUEN: Q With that,
3 Mr. Mansdorfer, could you confirm that you
4 received fees to appear pursuant to the
5 subpoena today.
6 A Yes, I did.
7 Q Very good. With that, just a bit
8 of an introduction, if you will, about the
9 basic ground rules of the examination under
10 oath today.
11 So you are here under subpoena,
12 which means you are required to appear and
13 answer questions today. We are, the Safety
14 and Enforcement Division, and when I say we,
15 I mean the Safety and Enforcement Division,
16 we are doing a pre-formal investigation in
17 the matter of the incident on October 23rd
18 and the surrounding circumstances related to
19 that incident at the Aliso Canyon field,
20 Southern California Gas' Aliso Canyon field.
21 You're here today to provide
22 knowledge and testify as to those
23 circumstances. It's why we've subpoenaed you
24 here today. We do not know at this point
25 whether this will in fact become an
26 investigation, a formal investigation, by the
27 Safety and Enforcement Division. It could.
28 It may in fact end up not becoming a

1 proceeding before the California Public
2 Utilities Commission. However, what you say
3 today will inform our thinking and our
4 decision making along that.
5 Do you understand all that?
6 A Yes.
7 Q If I say something that -- if I've
8 articulated something poorly or it doesn't
9 make sense, please do not guess in answering
10 the question. Please ask me to either
11 restate or rephrase, signal to me that I've
12 not said it well and I will do my best to
13 articulate it in a way that makes sense to
14 you.
15 Do you understand that?
16 A Yes.
17 Q Good. That is the extent of, for
18 now, the ground rules. Do you have any
19 questions before we get started on substance?
20 A No.
21 Q I'm sorry, one other thing just in
22 terms of the examination under oath for the
23 record. The examination under oath is like a
24 deposition. It is not a deposition. Your
25 own personal counsel is here, Mr. Gravelle,
26 but the difference is that we don't have an
27 underlying proceeding as the basis for this
28 so we call it in California Public Utilities'

1 parlance, Public Utilities Commission
2 parlance, an examination under oath. So if I
3 use the term "EUO," the letters "EUO," that
4 means examination under oath and that is what
5 I mean by that.
6 Do you understand that?
7 A Yes.
8 Q Very good. With that, if I could,
9 what I intend to do, as best I can throughout
10 much of the day, is just to give you a flag
11 for you, a set of -- I'll ask questions in
12 sets and there will be usually a thread, a
13 logical thread. My goal is to basically give
14 you, signpost for you, the subject matter
15 under which the questions intend -- what they
16 intend to get at just so you have an idea of
17 where I'm going.
18 So if you have any questions about
19 the nature of the subject area that I'm
20 asking, please don't hesitate to ask. It may
21 help facilitate your answers and the nature
22 of the questions.
23 Do you understand that?
24 A Yes.
25 Q So with that, the first general set
26 of questions is basically about your
27 background and about in particular I aim to
28 ask about how your background relates to the

1 field at Aliso Canyon in general and how you
2 are qualified to make recommendations with
3 regards to the incident that happened on
4 October 23, 2015.
5 Do you understand that?
6 A Yes.
7 Q So just with regards to your
8 biography, your basic background working at
9 Southern California Gas Company, what was
10 your role working for Southern California Gas
11 Company, or SoCalGas, and I may use that term
12 to refer to Southern California Gas Company,
13 related to Aliso Canyon?
14 A Well, I had a lot of different
15 roles over the years. For the last 15 years,
16 I was at SoCalGas. My position was Storage
17 Engineering Manager where I was responsible
18 for the wells and the reservoirs, inventory
19 verification, also land, mineral, and storage
20 rights.
21 Q Great. Thank you. And so the
22 15 years approximately, what was the start
23 date of your position as Storage Engineering
24 Manager?
25 A 1998.
26 Q So you finished up in that position
27 in 2013?
28 A Well, yeah, in 2013 I -- well, by

1 mutual agreement with the company, I worked
2 part-time one or two days a week for another
3 two years. I didn't actually fully leave the
4 company until 2015, but I was no longer in
5 that position of Storage Engineering Manager
6 for those last two years working part-time.
7 Q With regards to your position as
8 Storage Engineering Manager, were you
9 managing the wells in the field at Aliso
10 Canyon specifically or was it more than that?
11 A It was all the gas storage fields.
12 Q Honor Rancho and Playa del Rey
13 and -- which one am I missing?
14 A La Goleta.
15 Q La Goleta, thank you.
16 A I was also responsible for the
17 decommissioning phase of Montebello.
18 Q Very good. Thank you. And so you
19 held one title with regards to your work on
20 Aliso, just the --
21 A Well, I had other positions. I
22 mean I was in a lot -- prior to that
23 position, I was in a lot of different
24 positions. I had been based at Aliso Canyon
25 in the mid-'80s. I was -- I think the title
26 they used then was resident reservoir
27 engineer. So I was responsible, you know,
28 for the on-site operations of the wells and

1 the reservoir at that time. I was also in
2 several positions as drilling engineer and
3 later drilling manager where I was
4 responsible just for the drilling and
5 workover aspects of wells at all the fields
6 including Aliso Canyon.
7 Q Any other titles that you held
8 while working for SoCalGas pertaining to
9 Aliso Canyon?
10 A I don't -- I don't -- I mean I was
11 in some positions in the transmission
12 pipeline department where we had some
13 responsibility for the pipelines at Aliso but
14 not the wells.
15 Q Thank you for making that
16 distinction. That's helpful. I'm asking at
17 the level that you specified. With regards
18 to your time as drilling engineer and
19 drilling manager, approximately, just
20 approximate dates, if you can remember your
21 time holding those titles.
22 A Well, the drilling engineer
23 function would have been early '80s, and then
24 drilling manager was like '93 to '95 I think.
25 Q And I wrote that as drilling
26 manager you were responsible for drilling
27 workover fields. Did I get that right?
28 A Workover of the wells.

1 Q Okay.
2 A Yeah.
3 Q Got it. Thank you.
4 A Yeah.
5 Q Did you want to add to that?
6 A Workover just means existing wells
7 as opposed to drilling new wells.
8 Q Oh, I see. Thank you. So you
9 retired from Southern California Gas Company
10 in 2015?
11 A Right.
12 Q From 2013 to 2015 you said you held
13 a part-time role?
14 A Right.
15 Q Did I understand that right?
16 A Yes.
17 Q Can you talk about at a high level
18 what your role was part-time with respect to
19 Aliso Canyon.
20 A During that two years, I had pretty
21 minimal involvement with Aliso Canyon. I was
22 still responsible for the operations at
23 Montebello during that time and I was on some
24 other special projects. There was a native
25 gas project I had some responsibility for,
26 but pretty -- I had pretty minimal
27 responsibility at Aliso for that time period.
28 Q Minimal in what sense? Can you

1 talk about what role you did have at Aliso.
2 A Probably just with respect to any
3 activities under that native gas project.
4 Q The native gas project --
5 A So as far as the gas storage, I
6 didn't really have any responsibilities at
7 Aliso Canyon.
8 Q And what is the native gas project?
9 A Oh, that was a project that had
10 been approved by the CPUC where we were
11 looking for additional reservoirs, either oil
12 or gas, at the storage fields that were owned
13 by SoCalGas.
14 Q Thank you. So when you were doing
15 that work as a consult -- was that as a
16 consultant?
17 A No, I was still an employee.
18 Q You were still an employee.
19 A I just got paid for the actual
20 hours I worked rather than a salary.
21 Q I see. Did you work in a role as a
22 consultant for SoCalGas?
23 A I did for a short period during
24 when the well was out of control.
25 Q Yes, okay. I'll get to that
26 shortly. Thank you for clarifying that. I
27 appreciate it. I think by "out of control"
28 you mean you're referring to the incident

1 that happened on October 23, 2015; is that
2 right?
3 A Yes.
4 Q Understood. Thank you. With
5 regards to that incident that we just touched
6 upon, what during your tenure would you say
7 qualified you to make recommendations and
8 have insights with regards to killing the
9 well that went out of control on October 23,
10 2015?
11 A Well, I worked for, you know, well,
12 off and on for a 30-plus-year career of
13 working with wells. I don't know
14 specifically what to say in answer to that.
15 Q It's a particularly broad question
16 I will grant you, and I appreciate counsel's
17 indulgence on this, but in terms of with
18 regards to the 30 years, it seems as if you
19 had quite a bit of experience working in the
20 field at Aliso Canyon in particular.
21 Am I getting that right?
22 A Yes.
23 Q That's helpful. Let's go on to I
24 think in terms of just another set of
25 questions. That's helpful, thank you, just
26 the general background understanding.
27 In reviewing some of the documents
28 that your counsel, that Mr. Gravelle, sent to

1 us, I had gathered, if you will, a timeline
2 that identified -- that essentially noted
3 your communications with Southern California
4 Gas Company, the time between when you had
5 communicated to Southern California Gas
6 Company offering your services to help with
7 the well that went out of control.
8 And when Southern California Gas
9 Company essentially accepted your offer and
10 decided to ask you to come on board, if you
11 will, and provide your services. So I want
12 to just quickly and at a high level run
13 through that timeline if I may.
14 I have here what are Bates stamped
15 JM0005 through JM0007 inclusive. These are
16 the Bates stamp of what Mr. Gravelle provided
17 us. So these are some of your communications
18 I understand, and you can correct me if I'm
19 wrong, but I wanted to just confirm with
20 regards to this if I'm tracking the timeline
21 correctly that I just identified. That's
22 really the overarching nature of these
23 questions here.
24 Do you understand that?
25 A Yes.
26 Q If part of that doesn't make sense
27 as we go through this, please let me know and
28 I'll do my best to clarify. So this is --

1 MR. GRAVELLE: May I make a suggestion
2 just so the record is clear?
3 MR. GRUEN: Sure.
4 MR. GRAVELLE: Can you perhaps indicate
5 on the record what exhibit number it will be
6 marked. I'm not sure whether we're doing the
7 alphabet or Roman Numerals.
8 MR. GRUEN: I was thinking just plain
9 numbers, but I'm open to suggestions if you
10 prefer.
11 MR. GRAVELLE: No, no, that's fine.
12 MR. GRUEN: You want me to do that
13 ahead of time? Commonly I'll do it after
14 but --
15 MR. GRAVELLE: If it's okay with you.
16 MR. GRUEN: That's fine, absolutely.
17 MR. GRAVELLE: Thank you.
18 MR. GRUEN: So the Bates stamps JM0005
19 through JM0007 is an e-mail dated Friday,
20 November 20, 2015, 9:21 a.m. It looks like
21 it's from mansdorfer@aol.com to
22 jlane@semprautilities.com,
23 rphillips@semprautilities.com,
24 rschwecke@semprautilities.com, and
25 jcho@semprautilities.com. If we could have
26 that marked as Exhibit 2.
27 (Exhibit No. SED-02 was marked for identification.)
28

1 MR. GRUEN: Let's go off the record.
2 (Off the record.)
3 MR. GRUEN: Q Back on the record.
4 Mr. Mansdorfer, do you have in front of you
5 the document that I just referenced and asked
6 to be marked as Exhibit 2?
7 A I do.
8 Q So I am understanding this document
9 to show that on November 20th you
10 communicated with Mr. Bret Lane, Mr. Rick
11 Phillips, Mr. Roger Schwecke, and Mr. Jimmy
12 Cho, managers of SoCalGas Company, expressing
13 your thoughts on the Aliso well service
14 blowout.
15 Is that a correct understanding?
16 A Yes.
17 Q If I could characterize it -- so as
18 part of this letter, and I'm looking at the
19 first paragraph of it on JM0005 where you
20 say -- I think it's the third line down --
21 "I have offered my assistance to
22 Scott Ferguson and Phil Baker to
23 help solve this problem starting at
24 Lee's house on that first Saturday,
25 but they have not shown any
26 interest."
27 Do you see that?
28 A Yeah.

1 Q So just a clarification. When
2 you're referring to the solving of this
3 problem in that sentence, is that referring
4 to the October 23, 2015, incident where Well
5 SS-25 went out of control?
6 A Yes.
7 Q I'll just back up. You're familiar
8 with Well SS-25?
9 A Yes.
10 Q And what does that well -- what
11 does that term mean to you generally
12 speaking?
13 A The term?
14 Q What does that refer to? Does that
15 refer to a well at the Aliso Canyon field?
16 A Yes.
17 Q And is it a Standard Sesnon 25?
18 A Yes.
19 Q So it's one of the wells at Aliso?
20 A Yes.
21 Q And it's the well that went out of
22 control on October 23, 2015; is that right?
23 A Yes.
24 Q Just a couple of questions about
25 that sentence. When you talk about Lee's
26 house, can you give us some background on who
27 Lee is.
28 A Lee Stewart. He was the senior

1 vice president of gas operations for many
2 years.
3 Q For SoCalGas Company?
4 A Yes.
5 Q And who is Scott Ferguson?
6 A I think he was in a vice president
7 position at the time. I didn't really know
8 him. I met him at that get-together at Lee's
9 house.
10 Q And, again, vice -- when you're
11 speaking, these are positions, management
12 positions, at Southern California Gas
13 Company; right?
14 A Yes.
15 Q And how about Phil Baker?
16 A Phil, he was my last supervisor or
17 manager before I fully retired from SoCalGas.
18 I think he was Director of Storage
19 Operations.
20 Q Okay. And so you said you hadn't
21 met Scott Ferguson before. Did I get that
22 right?
23 A Yes.
24 Q How did you know Lee?
25 A I worked with Lee for many years.
26 Q During your time at SoCalGas?
27 A Yes.
28 Q How about Phil? How did you know

1 Phil?
2 A Well, he was my last supervisor.
3 Q You did say that. How long did you
4 know Phil?
5 A I knew him for many years. I
6 didn't work with him closely until he became
7 my supervisor.
8 Q All right. Staying at just with
9 the timeline then, thank you for talking
10 about the different roles and relationships a
11 little bit. The timeline, I was trying to
12 figure out -- if we could go off the record
13 just a second.
14 (Off the record.)
15 MR. GRUEN: Q Back on the record.
16 First of all, the communication on
17 November 20th that we just referred to in the
18 e-mail, is that the first time you
19 communicated with SoCalGas Company related to
20 the incident on October 23, 2015, on Well
21 Access 25?
22 MR. GRAVELLE: Do you mean in writing
23 or oral?
24 MR. GRUEN: Q Either.
25 A I can't answer either way. This is
26 three years ago.
27 Q I appreciate that.
28 A I don't -- I can't answer.

1 Q Okay. I'm asking in part because
2 this was the first written communication we
3 could find in the documentation that you
4 provided us to Southern California Gas
5 Company. So let's go with the written part
6 if we could.
7 To the best of your recollection,
8 is this the first written communication that
9 you had with Southern California Gas Company?
10 A I -- yeah.
11 Q Okay. How about with Bret Lane?
12 Was it the first written communication you
13 had with regards to the -- I'll call it "the
14 incident" for shorthand if I can. You know
15 what I mean by "the incident," that that
16 means the October 23, 2015, well going out of
17 control at Aliso?
18 A I know what you mean, yes.
19 Q So was it the first time you
20 communicated with Bret Lane with regards to
21 the incident do you know?
22 A Again, I can't say for sure, but I
23 haven't looked at any of this stuff for three
24 years, almost three years.
25 Q Okay. With regards to the meeting
26 at Lee's house that you mention in there,
27 could you tell us about what you recall, to
28 the best of your recollection. I know it was

1 three years ago. I appreciate that. But
2 what do you recall discussing at Lee's house?
3 A Well, we, you know, this was like
4 the day after it was discovered or something,
5 a day or two after, and there was some
6 discussion about it. I know Phil and Scott
7 were on the phone with people and, you know,
8 I offered if there was anything I could do to
9 help. They didn't seem interested in it so
10 that was pretty much it.
11 Q Yeah, you've written it's the first
12 Saturday so that was the Saturday essentially
13 after the incident that you were referencing
14 in the November 20th e-mail; is that right?
15 A Yes.
16 MR. GRUEN: Let's go off the record for
17 just a second.
18 (Off the record.)
19 MR. GRUEN: Q Back on the record.
20 What I have here is a document that is Bates
21 stamped JM0042. It appears to be an e-mail
22 from mansdorfer@aol.com. At the top of it,
23 it's to . It's dated Monday, December 7,
24 2015. It looks like it's an e-mail thread
25 including others but that's just for purposes
26 of identification. I'd ask that that be
27 marked as Exhibit 3.
28 MR. GRAVELLE: Excuse me, can we add

1 the following page that is Bates stamped
2 JM0043 so it's a complete e-mail?
3 MR. GRUEN: Absolutely.
4 MR. GRAVELLE: Thank you.
5 MR. GRUEN: Absolutely, let's do that
6 with that caveat. We'll have JM0042 and
7 JM0043 marked as Exhibit 3 together.
8 MR. GRAVELLE: Thank you.
9 (Exhibit No. SED-03 was marked for identification.)
10
11 MR. GRUEN: Q If we could turn to
12 JM0043, since this is an e-mail, I think it's
13 in reverse order. The first e-mail in the
14 chain appears to be at the last part of the
15 thread. At the bottom of JM0042 there's an
16 e-mail from Bret Lane. It's dated
17 December 7, 2015, at 11:01 a.m. It looks
18 like it includes a Jimmy Cho and Roger
19 Schwecke. The subject is "RE: Aliso Well
20 Mansdorfer thoughts."
21 Do you see that?]
22 A Yes.
23 Q Okay. And it says in the body, I'm
24 reading,.
25 "Jim, apologies for the delay in
26 getting to you. Would you consider
27 joining the team up here as a
28 technical advisor for me and the

1 company? Your background and
2 experience would be tremendously
3 helpful. I'm also trying to bring
4 in a couple of others, one, the
5 retired lead for Mobil who ran their
6 critical well team. Another is from
7 the relief well side. As for time
8 commitment, it would be what you
9 spare -- what you can spare," et
10 cetera, and that's from -- it's --
11 it's from Brett.
12 So is that an e-mail to you from
13 Brett Lane?
14 A Yes.
15 Q And dated December 7th, 2015.
16 Correct?
17 A Yes.
18 Q Do you recall, was that the first
19 time that you heard back from Southern
20 California Gas Company inviting you to work
21 on the incident?
22 A I think so.
23 Q Okay. And you responded,
24 continuing, now working backwards onto
25 JM0042, Monday, December 7th, at 2015,
26 1:32 p.m. It's -- this is an e-mail as part
27 of this thread from Mansdorfer to Brett Lane,
28 cc'g Jimmy Cho -- Jimmy Cho and Rodger

1 Schwecke, saying, "Brett, I would be happy to
2 help," and it continues on.
3 So that -- that signified your
4 agreement to --
5 A Yes.
6 Q -- work on the incident at Aliso
7 Canyon?
8 A Yes.
9 Q Okay. Very good. Okay. So -- so
10 you had agreed, on December 7th, that you
11 would help the -- in a technical role
12 advising on how to solve the problem of the
13 incident at Aliso?
14 A Yes.
15 Q Okay. Very good. So, by my rough
16 math, we -- between November 20th and
17 December 7th, the time you offered to help to
18 SoCalGas' management and the time that you
19 were asked to come help, that's about two and
20 a half weeks, if I'm getting that right.
21 So, in that time span, did -- did
22 Southern California Gas Company explain to
23 you the -- the reason for the amount of time
24 it took them to invite you to help on the
25 Aliso incident after your November 20th
26 e-mail?
27 A Not that I recall.
28 Q Okay. And let's go back to JM0005

1 on Exhibit 1, if you still have that in front
2 of you. And so, I see that this is entitled
3 "Mansdorfer Thoughts on Aliso Well Subsurface
4 Blowout." And without getting really into
5 the details here, would it -- would you
6 accept this -- a characterization of this
7 e-mail, generally speaking, as your
8 recommendations for how to fix the incident
9 and fix the well?
10 A Yes.
11 Q Okay. And so when you first joined
12 the technical advisory team, just to use
13 another term -- and by technical advisory
14 team, I'm -- mean the -- the team that you
15 joined and spoke to, the other team of -- of
16 people who were working on trying to fix
17 the -- the -- the well that had an --
18 experienced an incident on October 23rd,
19 2015. Do you understand that?
20 A Yes.
21 Q Okay. So when you joined the --
22 the technical advisory team, did you learn if
23 SoCalGas had followed your recommendation
24 that you sent on November 20th, 2015?
25 MR. GRAVELLE: Excuse me. I need to
26 interpose an objection.
27 MR. GRUEN: Okay.
28 MR. GRAVELLE: I have to speak a little

1 bit here to sort of give you an idea.
2 MR. GRUEN: Okay.
3 MR. GRAVELLE: The -- in the cover
4 letter I sent over with the documents, I
5 explained that during the period in December,
6 the short period when he was a technical
7 advisor, he is subject to a confidentiality
8 agreement that prevents him from disclosing
9 any -- anything that he learned or discussed
10 during that time period without SoCalGas'
11 permission; and, of course, if you can get
12 SoCalGas' permission, he will certainly
13 answer the questions. But, I think the way
14 you phrased that, if you were to go back
15 and -- is that he would have to disclose if
16 he learned -- if he learned of the
17 information while he was employ -- retained
18 as a technical advisor; hence, it would
19 require him to divulge or -- or breach the
20 confidentiality provision. So perhaps
21 there's another way to ask the question while
22 honoring that commitment he's made.
23 MR. GRUEN: Okay.
24 MR. GRAVELLE: And if you want to go
25 off the record to talk about that --
26 MR. GRUEN: Yeah.
27 MR. GRAVELLE: -- we can do that.
28 MR. GRUEN: Yeah. Let's go off the

1 record briefly. Thank you.
2 (Off the record.)
3 MR. GRUEN: Let's go back on the
4 record.
5 So, while we were off the record, we
6 were just discussing the nature of the
7 confidentiality agreement.
8 And Mr. Gravelle, do you want to
9 expound on that a bit?
10 MR. GRAVELLE: Yes. Just to offer some
11 insight here, there is a two-page
12 confidentiality agreement between
13 Mr. Mansdorfer and SoCalGas that I will call
14 a confidentiality agreement regarding his --
15 his tenure as a technical advisor for a
16 period of time in December of 2015 that
17 imposes upon him certain confidentiality
18 obligations. We have not produced that
19 agreement, but you could certainly get it
20 from SoCalGas --
21 MR. GRUEN: Yeah.
22 MR. GRAVELLE: -- and -- and/or get the
23 authorization from them in writing for us to
24 release it to you. And I -- I think, if you
25 described it as the two-page confidentiality
26 agreement, that would probably be a
27 sufficient description of that, and I'm not
28 aware of a separate written agreement.

1 MR. GRUEN: Okay.
2 MR. GRAVELLE: In other words, that
3 description should not leave any ambiguity as
4 to what we're talking about.
5 MR. GRUEN: Okay. Very good.
6 Q And Mr. Mansdorfer, is that your --
7 an accurate description of your understanding
8 of the agreement that you entered into with
9 Southern California Gas Company?
10 A Yes.
11 Q Okay. Very good. Thank you.
12 And so, just so I understand, that
13 agreement applied -- the dates in which that
14 applied -- you may have mentioned this, but
15 just to be sure that I caught it, it applied
16 during Mr. Mansdorfer's tenure advising
17 SoCalGas when he was asked to join the
18 technical advisory team on SoCalGas, and then
19 when he finished his tenure advising SoCalGas
20 with respect to the incident?
21 MR. GRAVELLE: Let me --
22 MR. GRUEN: Let's go off the record for
23 just a second.
24 MR. GRAVELLE: No, that's fine. We can
25 stay on the record.
26 MR. GRUEN: Oh, okay. Back on the
27 record.
28 MR. GRAVELLE: I'm obviously not under

1 oath, but I'll give you my best
2 understanding. I don't have it in front of
3 me. But, it applies to information that he
4 learned or gained while working as a
5 technical advisor, and it's my presumption
6 that those obligations would continue
7 thereafter.
8 MR. GRUEN: Yeah.
9 MR. GRAVELLE: It's my understanding it
10 would not apply to information he learned
11 prior to his retention as a technical
12 advisor, i.e. information he knew working as
13 an employee of SoCalGas.
14 MR. GRUEN: Okay. All right. All
15 right. Thank you.
16 MR. GRAVELLE: Sure.
17 MS. GRUEN: Q So prior to coming on
18 board, prior to signing the agreement that we
19 just -- that Mr. Gravelle just referred to,
20 did you learn if SoCalGas had followed any
21 portion of your recommendation that you sent
22 on November 20th, 2015?
23 A I don't believe I did.
24 Q Okay.
25 A I had very limited communication.
26 I -- yeah.
27 Q Okay. Do you remember
28 approximately when you finished your role

1 working for SoCalGas on the Aliso incident?
2 A It was around Christmas --
3 Q Okay.
4 A -- of that year.
5 Q Okay.
6 Let's go off the record for a
7 second.
8 (Off the record.)
9 MR. GRUEN: Let's go back on the
10 record, if we can.
11 Q Mr. Mansdorfer, if I can switch
12 topics to just a general set of questions
13 that maybe I'll characterize as subsurface
14 safety valves and recommendations regarding
15 that, do you know what I mean when I use the
16 term subsurface safety valve?
17 A Yes.
18 Q What does that term mean to you?
19 A It's a valve that is installed in a
20 well that shuts flow off from the well.
21 Q Yeah. Thank you. So if we could
22 go back to Exhibit 1 that you have in front
23 of you, which I believe is the document on
24 your left --
25 A Yes.
26 Q And in the -- that Exhibit 2 -- I
27 see we're on the same page, from you
28 signalling me there, yes.

1 That's Exhibit 2, and it's JM0005,
2 and in the second paragraph of that -- that
3 document, you talk about installing
4 subsurface safety valves in order to protect
5 against the possibility of a hundred -- the
6 120 wells at Aliso from shearing in the event
7 of an earthquake along the Santa Susana
8 fault.
9 A What? I don't see that.
10 Q Do I have the wrong document? Bear
11 with me. No. I'm sorry. I think I do have
12 the wrong document. Bear with me a second.
13 Ah, excuse me. I apologize. That -- that is
14 an incorrect document.
15 If we could -- if I could show you
16 JM0031 and JM0032, this is marked from you.
17 MR. GRAVELLE: This will be Exhibit 4?
18 MR. GRUEN: Exhibit 4, that's my
19 understanding.
20 MR. HOLTER: Yep.
21 MR. GRUEN: Let's see if I have a copy
22 for the court reporters. Bear with me a
23 second.
24 Q And if you have a chance, while I'm
25 circulating the -- the document, to look at
26 the second paragraph there.
27 And while you're doing that, I'll
28 identify this as Exhibit 4, JM0031, JM0032.

1 This appears to be a -- an e-mail from
2 Mansdorfer@aol.com to Davnamthom@aol.com
3 dated Monday, November 30th, 2015, at
4 9:05 a.m. That's the first e-mail in the
5 thread.
6 (Exhibit No. SED-04 was marked for identification.)
7
8 MR. GRUEN: Q And --
9 A Yes. Yes, I see it.
10 Q Okay. And that -- does -- I know
11 you were reading. You may not have been
12 listening to me at the same time.
13 A No. That's correct.
14 Q The information I stated is
15 accurate about the -- the e-mail?
16 A Yes.
17 Q Okay. Very good. So I apologize
18 for referring to the wrong document there,
19 but now we have the correct one in front of
20 us, I believe. So I think you're answering
21 that the question I asked was -- was correct,
22 but just, for the record, let me be sure that
23 I have it right.
24 In this second paragraph here, you
25 talk about installing subsurface safety
26 valves in order to protect against the
27 possibility of 120 wells -- the 120 wells at
28 Aliso from shearing in the event of an

1 earthquake along Santa Susana fault. Is that
2 correct?
3 A Yes.
4 Q Okay. Do you recall providing us
5 with a study from your colleagues identifying
6 the Santa Susana fault ran through the Aliso
7 field, and was on the system that experienced
8 two earthquake events, both Sylmar in 1971
9 and Northridge in 1994?
10 MR. GRAVELLE: Excuse me. You said do
11 you recall him providing you with the --
12 MR. GRUEN: Uh-huh. Yeah. I -- let's
13 go off the record.
14 (Off the record.)
15 MR. GRUEN: Let's go back on the
16 record.
17 Q Do you -- to your knowledge, have
18 you been informed that the Santa Susana fault
19 runs through the -- the Aliso field?
20 A Yes.
21 Q And does it intersect with all of
22 the wells in the Aliso field?
23 A Yes.
24 Q Okay. And to your knowledge, does
25 the -- is the Santa Susana fault part of the
26 system that experienced the -- the 1994
27 Northridge earthquake?
28 A No, it's not.

1 Q Oh, it's not?
2 A No.
3 Q Okay. What about the Sylmar
4 earthquake in 1971, do you know?
5 A You know, I'm not a geologist.
6 I -- I -- I don't think it's the same system.
7 Q Okay.
8 A I think there may have been a small
9 movement on a small piece of the Santa Susana
10 fault during that earthquake, but I don't
11 think it's the same system; but, again, I'm
12 not an expert on that.
13 Q Understood. Okay. If you look at
14 the second paragraph again, and I'm reading
15 from the fourth line from the bottom of that
16 paragraph on Exhibit 4, there I'm reading.
17 "My proposal was to install
18 subsurface safety valves at the
19 bottom of the well under the fault.
20 They were concerned enough back in
21 the 1970s that they did this but the
22 technology wasn't up to it then and
23 the valves all failed quickly. Now,
24 due to the deep water offshore wells
25 the technology is there. I never
26 could convince them of this risk,
27 though."
28 Do you see that?

1 A Yes.
2 Q And that's -- that's referencing
3 your -- that's a writing from you to Thom in
4 this e-mail. Is that correct?
5 A Yes.
6 Q Okay. When you say, "due to deep
7 water offshore wells the technology is there"
8 in that passage we just read, that I just
9 read, does that mean there are -- that there
10 are effective subsurface safety valves that
11 could successfully shut off the gas flow on
12 the wells at Aliso Canyon?
13 MR. GRAVELLE: I'm sorry. Could the
14 court reporter read that back to me?
15 MR. GRUEN: Go ahead.
16 (Record read.)
17 MR. GRAVELLE: Effective and successful
18 are vague and ambiguous, calls for
19 speculation.
20 MR. GRUEN: Okay.
21 Q Are there -- I'll rephrase.
22 Are there subsurface safety valves
23 that you're referencing in that passage that
24 I just read that would work to turn off
25 gas -- the gas on the -- the gas flow on
26 wells at Aliso Canyon?
27 MR. GRAVELLE: Calls for speculation.
28 MR. GRUEN: Q Can you answer, anyway?

1 Are you able to answer that question?
2 A Well, it's obvious, when I wrote
3 this, that I thought that was the case. I
4 didn't have any direct experience or evidence
5 of that, though.
6 Q Okay. When -- I am struggling with
7 counsel's -- I want to be mindful of
8 counsel's objection, and be sure that you
9 understand the question, because if I'm not
10 articulating it well, and you don't
11 understand it, then I want to be sure I state
12 it in a way that you do.
13 So do you have any concerns or
14 confusion about what I mean --
15 A No, I don't think so.
16 Q Okay. Okay. All right.
17 A No. I think, when I answered it,
18 is correct. You know, in this casual
19 conversation with my friend, I essentially
20 indicated I thought the technology was there;
21 but, I don't have experience with those
22 valves directly --
23 Q Understood.
24 A -- so --
25 Q I think I see the basis for
26 counsel's objection now. Okay. So I'm not
27 going to ask you to guess. I'm asking you
28 for your knowledge.

1 So it -- when you wrote this,
2 you -- it was an opinion, but you didn't have
3 the facts there to --
4 A That's correct.
5 Q -- understand? Okay. I follow.
6 Okay.
7 Do you have knowledge, based on
8 your work at -- for Southern California Gas
9 Company, about subsurface safety valves, the
10 latest ones that are available today?
11 A No.
12 Q Do you have knowledge about
13 subsurface safety valves, the latest ones
14 that were available, during your time the --
15 the -- the time that you -- as of the time
16 that you worked on the incident for
17 SoCalGas?]
18 A Well, of a certain type, the type
19 that are set near the top of the well, but
20 not the type that I was referring to here
21 that could be run underneath the fault.
22 Q What was your basis for making this
23 statement when you said it?
24 A Some research I had done on the
25 technology back when I was at SoCalGas.
26 Q Can you say more about the research
27 that you had done on the technology when you
28 were at SoCalGas.

A Just reviewing the manufacturers, you know, what they published on their valves.

Q The research that you had done on SoCalGas, did that give you reason to believe that valves could be installed below the fault line at Aliso?

A It did.

Q Why did it give you the reason to believe that?

A Well, again, just reading what the manufacturers published in their sales brochures and so on.

Q Did you talk with anyone at SoCalGas about installing subsurface safety valves below the Santa Susana fault line at Aliso while you were working for SoCalGas?

A Yes.

MR. GRAVELLE: You're referring to excluding the time when he was a technical adviser?

MR. GRUEN: Correct, I am.

Q Do you want me to restate the question?

A No, I think I answered it.

Q You did talk to others about installing subsurface safety valves and counsel is right. Why don't we say as a

1 general disclaimer because the objection is
2 noted. For purposes now, why don't we say
3 that we're excluding communications during
4 your time as a technical adviser when the
5 confidentiality agreement applies unless and
6 until we get clearance from SoCalGas to
7 disclose that information.
8 So at this point I'm not asking
9 questions about the communications you had as
10 a technical adviser to fix the incident. Do
11 you understand that?
12 A Yes.
13 MR. GRAVELLE: And thank you. One
14 clarification, could it also include
15 information he learned solely based upon
16 being a technical adviser; that is, if you
17 learned something both before -- if you knew
18 it independent of being a technical adviser,
19 that would be fine. But if you learned it
20 solely based on being a technical adviser, it
21 would be subsumed within Mr. Gruen's
22 exclusion.
23 MR. GRUEN: That would be acceptable to
24 us.
25 Q Do understand that?
26 A Yes.
27 Q All right. So then asking about
28 your time prior, not the technical advisory

1 time and not things that you learned
2 exclusively because you were a technical
3 adviser but your time while working for
4 SoCalGas otherwise, who did you talk to at
5 SoCalGas about installing subsurface safety
6 valves below the Santa Susana fault line at
7 Aliso Canyon?
8 A Primarily my supervisors.
9 Q And what did you tell them?
10 A I told them my concern that the
11 fault could move, it's considered an active
12 fault and it could shear all the wells in the
13 field and release a huge amount of gas.
14 Q Did you voice a concern, if I'm
15 understanding right, that what happened on
16 Well Access 25 then could have happened on
17 all the wells if such a shearing occurred?
18 MR. GRAVELLE: Objection, misstates his
19 testimony.
20 MR. GRUEN: It may. I'll rephrase.
21 Q Was there a concern that -- well,
22 let me just ask it open-ended. What would
23 the concern have been with releasing gas if
24 all of the wells at Aliso had sheared along
25 the fault line?
26 A Well, that the gas could reach the
27 surface and cause safety concerns.
28 Q Did you voice that concern to your

1 direct supervisors at SoCalGas?
2 A Yes.
3 Q What was the response that you
4 received when you voiced that concern?
5 A Well, there were studies done in
6 regard to that. There was some, I think,
7 belief at some level of the company that it
8 wasn't a problem to be worried about.
9 Q Were you told why this was a belief
10 at the Company, that it wasn't a problem to
11 be worried about?
12 A No, not that I remember.
13 Q Did you make any communications in
14 writing regarding what we just talked about?
15 A I did.
16 Q To whom?
17 A To my boss.
18 Q I'm sorry, who was that at the
19 time?
20 A Well, Rudy Weibel.
21 Q Can you spell that for the court
22 reporter.
23 A W-e-i-b-e-l.
24 Q What was Rudy's response to that
25 recommendation?
26 A Well, it took some time. We had a
27 team. We studied the issues. And in the
28 end, I don't know, that concern, again, about

1 the fault was not believed to be an issue
2 that we should worry about.
3 Q Do you recall the time that you
4 made the written communications identifying
5 your concerns?
6 A Well, there's -- yeah, starting in
7 2009.
8 Q How long did you continue to voice
9 your concerns related to this topic?
10 A Well, you know, we studied it for a
11 few years. It wasn't specifically that. I
12 mean there was some work that was done
13 specifically on the fault, but I think as
14 long as I was in that position of storage or
15 Storage Engineering Manager, I expressed that
16 concern.
17 MR. GRUEN: Off the record, please.
18 (Off the record.)
19 MR. GRUEN: Q So do you have a general
20 sense of timing starting in 2009 how long you
21 continued to voice the concerns regarding
22 shearing of the wells?
23 A Like I said, as long as I was in
24 that position of being responsible for the
25 wells through 2013.
26 Q And during that time when you
27 voiced the concerns, Southern California Gas
28 Company continued to maintain a belief that

1 it wasn't necessary to do anything with
2 regards to the concern that you voiced?
3 MR. GRAVELLE: Objection, misstates
4 testimony, calls for speculation.
5 MR. GRUEN: I'll restate.
6 Q From 2009 to 2013, what was the
7 response that you received to that concern
8 that you identified?
9 MR. GRAVELLE: Other than what he's
10 testified to?
11 MR. GRUEN: What I'm trying to get at
12 is I heard -- and correct me if I'm saying
13 this incorrectly -- I heard you say that
14 there was a belief from SoCalGas that it
15 wasn't needed.
16 MR. GRAVELLE: Some.
17 MR. GRUEN: Some?
18 MR. GRAVELLE: My notes indicate that
19 he said "some believed."
20 MR. GRUEN: Some believe.
21 MR. GRAVELLE: And I think that's
22 where I was --
23 MR. GRUEN: That's helpful.
24 MR. GRAVELLE: Yeah, I interpreted your
25 question as being a characterization of the
26 entire company.
27 MR. GRUEN: Got it.
28 Q Is that accurate?

1 A Yes.
2 MR. GRUEN: So there was some belief
3 amongst SoCalGas. Thank you.
4 MR. GRAVELLE: Yeah.
5 MR. GRUEN: Q There was some belief
6 amongst SoCalGas that it wasn't needed to
7 address the shearing concern?
8 A Yes.
9 Q What about others? Were there
10 others who responded that it was necessary to
11 address the shearing concern at Aliso?
12 A Well, there was -- I mean several
13 of the bosses I had did understand my
14 concern. I'm not sure whether they agreed
15 with it or not.
16 Q Okay. You're not sure whether they
17 agreed. So did you ever hear affirmatively
18 that anyone agreed with the shearing concern
19 you identified?
20 A Repeat that again, I'm sorry.
21 Q Did you ever receive any
22 communication from your direct supervisors or
23 anyone else agreeing that shearing of the
24 wells at Aliso was a concern?
25 A I think I did receive confirmation
26 they understood my concern and they weren't
27 sure whether it was an issue, but they didn't
28 directly dismiss it either.

1 Q Did you receive any communications
2 that anyone was willing to do anything to
3 address the shearing concern that you
4 identified?
5 A It's a long time ago.
6 Q Understood. Take your time. Take
7 your time if you want to take a moment to
8 just think back and recall. I recognize that
9 we're talking about almost 10 years ago, so
10 to the extent that you can remember, it's
11 helpful.
12 A I don't really remember enough to
13 say anything with any definitiveness.
14 Q Understood. Thank you. Just so I
15 understand the last statement, you didn't
16 observe any action on the company's part to
17 address the shearing concern that you
18 identified. Did I get that right?
19 A Yes.
20 Q When you had identified the
21 shearing concern, did you talk with anyone
22 about the option of installing subsurface
23 safety valves to address the concern?
24 A Yes.
25 Q Who did you talk to?
26 A Well, starting in 2009 with my boss
27 Rudy Weibel.
28 Q And who else do you recall?

1 A Well, my next boss after he retired
2 was Roger Schwecke and it was discussed with
3 him.
4 Q And what were the reactions of
5 those gentlemen that you heard?
6 A I think, you know, some
7 understanding of my concern.
8 Q Okay.
9 A I think it was at a higher level
10 where there wasn't a belief that was an
11 issue.
12 Q From both of those gentlemen, there
13 was no belief that this was a concern?
14 A No, it was from a higher level in
15 the company; above them.
16 Q I see. Do you know from whom above
17 them there was -- so when you say at a higher
18 level than them, it wasn't a concern, if I'm
19 understanding correctly. Do you know who
20 didn't have that concern?
21 A I believe it was Bret Lane.
22 Q Did you see anything or hear any
23 communications from Mr. Lane stating that the
24 shearing wasn't a concern?
25 A Yeah, there was an e-mail.
26 Q Do you remember the approximate
27 time of the e-mail?
28 A I think that was 2012.

1 Q Do you recall the e-mail talking
2 about -- let me rephrase. Was the e-mail
3 responding to not just the shearing concern,
4 but the option of installing subsurface
5 safety valves to address it?
6 A No.
7 Q Was there any discussion with
8 Mr. Lane to your knowledge about installing
9 subsurface safety valves?
10 A No.
11 Q So the e-mail was limited to just
12 saying --
13 A The fault itself, yeah.
14 Q At Aliso was not a concern?
15 A It didn't say that specifically.
16 It just said we were going to -- it was
17 regarding a meeting we were having about well
18 integrity, and it just said we're not going
19 to discuss the Santa Susana issue.
20 Q Oh, I see. If we were to ask for
21 that e-mail, how would we identify it so that
22 SoCalGas would understand what we were
23 talking about?
24 A It would be a 2012 e-mail from Bret
25 Lane to I think I was copied and Roger
26 Schwecke.
27 Q Thank you. And do you recall
28 anything about what was in the subject line

1 of the e-mail?
2 A No, I don't.
3 Q When the e-mail stated from
4 Mr. Lane that you were not going to discuss
5 the Santa Susana issue, what did that mean to
6 you?
7 A It meant he didn't want to talk
8 about the fault moving and shearing all the
9 wells.
10 Q Did you understand that to mean at
11 that meeting or in general?
12 A Well, it was in regard to that
13 meeting specifically.
14 Q In regard to that meeting.
15 A Yeah.
16 Q Okay. Did you have occasion to
17 communicate with Mr. Lane about the Santa
18 Susana issue, as you just referred to it, at
19 a later point in time?
20 A I don't recall.
21 Q To your knowledge, did anyone talk
22 about the Santa Susana issue at a later point
23 in time after the 2012 e-mail?
24 A I don't recall that either.
25 Q I'll refer to him as Rudy and you
26 know who I mean, your supervisor?
27 A Yes.
28 Q Do you approximately have an idea

1 how many times you identified the Santa
2 Susana issue, the shearing concern that is,
3 to Rudy?
4 A I don't remember specifically. It
5 was more than once, but probably limited to,
6 you know, a handful of times we discussed it.
7 Q To your knowledge, did anyone else
8 at SoCalGas recommend installing subsurface
9 safety valves on the wells at Aliso Canyon?
10 A No.
11 Q To your knowledge, did anyone else
12 identify the risk or problem of the wells
13 shearing?
14 A No.
15 Q Let me restate it. To your
16 knowledge, did anyone else share the concern
17 that you identified of the wells at Aliso
18 shearing?
19 MR. GRAVELLE: Calls for speculation.
20 MR. GRUEN: Well, I'm asking what he
21 knew.
22 MR. GRAVELLE: If he knows.
23 MR. GRUEN: If he knows, yeah.
24 MR. GRAVELLE: Okay.
25 MR. GRUEN: Q So to your knowledge,
26 did anyone else identify the concern of the
27 amount of wells shearing at SoCalGas?
28 A Well, I think, like I said earlier,

1 you know, when I discussed it with people,
2 there was some acknowledgment there might be,
3 but they -- I think they didn't believe they
4 had the technical knowledge to know whether
5 there really was a concern there or not.
6 Q And did anyone to your knowledge
7 talk with those who did have the technical
8 background to understand whether wells
9 shearing at Aliso were a concern?
10 A I don't know.
11 Q Did you ever talk to someone
12 yourself who had knowledge about the shearing
13 concern that you identified at Aliso?
14 A Well, I did have a geologist look
15 at it.
16 Q What was the name of the geologist?
17 A I don't remember.
18 Q What do you recall the geologist
19 finding?
20 A He said it was a possibility but
21 there is just not enough known about that
22 fault to say for sure whether it would be a
23 concern or not.
24 Q Did you talk to anyone with
25 knowledge about the effectiveness of
26 subsurface safety valves, let's say, after
27 2000 during your time at SoCalGas?
28 MR. GRAVELLE: Are you referring to

1 deepset or shallow set?
2 MR. GRUEN: Good clarification. I
3 appreciate that.
4 Q Let's couch it this way: The
5 effectiveness of installing subsurface safety
6 valves below the Santa Susana fault line at
7 Aliso.
8 A So repeat the whole question.
9 Q Yes, I will. Did you talk to
10 anyone about the effectiveness of installing
11 subsurface safety valves below the Santa
12 Susana fault line on the Aliso wells from
13 2000 until your retirement?
14 A I'm sure there were discussions
15 about the possibility of that. I don't
16 recall any discussions about the
17 effectiveness or whether the valves would be
18 effective.
19 Q Okay.
20 A Not to say there wasn't, but I
21 don't remember any specific conversations.
22 Q So I heard from earlier, and I
23 appreciate counsel's question that I was
24 probing maybe areas of knowledge that you
25 didn't have with regards to subsurface safety
26 valves. Part of this is just my limitation
27 of knowing, my limited understanding of
28 knowing where your knowledge limits are, so

1 if I trip over that line, please do correct
2 me. I appreciate that.
3 What I'm trying to get at at a
4 general level is your knowledge of and where
5 the limits of your knowledge are with respect
6 to subsurface safety valves that could have
7 been installed below the fault.
8 So with regards to that, you
9 mentioned that you did some research on
10 publications. Can you describe at a high
11 level the amount of confidence you had, based
12 on your own research, of whether these -- the
13 research you did would mean that the
14 subsurface safety valves would work below the
15 Santa Susana fault line.
16 A I think I had a reasonably
17 confident belief they would work, but I
18 didn't, you know, it was never tried in that
19 specific application. So I think at the time
20 I thought it was worth investing time and
21 money to look into it but...
22 Q Did you think it was worth time and
23 money to invest into trying out one or two
24 wells?
25 A Well, actually we did try one
26 deepset valve at the Goleta field. It
27 actually had some problems with it. I don't
28 know that that meant it wouldn't have worked

1 at Aliso, but I think it would have
2 encouraged other people's beliefs that
3 deepset subsurface safety valves just were
4 going to have problems.
5 Q Approximately what point in time
6 did the trial of the one deepset valve at
7 Goleta occur?
8 A You can look that up on the
9 records.
10 Q Sure.
11 A Sometime in the, oh --
12 Q If you know. If you have an
13 approximate sense. I get it was a while ago.
14 A Yeah, it was probably after 2000.
15 Q That would help us hone our focus,
16 too, so thank you.
17 MR. GRAVELLE: By the way, you did get
18 a response from SoCalGas on an e-mail.
19 MR. GRUEN: Let's go off the record for
20 a second.
21 (Off the record.)
22 MR. GRUEN: Q If we could go back on
23 the record. Let me ask generally. Are there
24 e-mails or other writings in your capacity
25 while you were employed by SoCalGas
26 discussing topics related to the installation
27 of subsurface safety valves at Aliso Canyon?
28 A Well, I don't have them. I mean

1 those were all in the SoCalGas system if
2 there were any.
3 Q Okay. So to your knowledge then, a
4 deepset, if you will, subsurface safety valve
5 was not installed at Aliso Canyon during your
6 tenure; is that accurate?
7 A I believe that's accurate.
8 Q If working in modern deepset
9 subsurface safety valve had been installed on
10 SS-25, based on your research and your
11 knowledge, prior to October 23, 2015, would
12 it have saved Well SS-25?
13 MR. GRAVELLE: Objection, calls for
14 speculation.
15 MR. GRUEN: Just asking to his
16 knowledge.
17 THE WITNESS: Well, I think that's -- I
18 mean there's a good chance it would have, but
19 there is I mean some speculation on whether
20 it definitely would have or not.
21 MR. GRUEN: Q Okay, understood. I
22 appreciate the speculation point, but the
23 part where you're saying there's a good
24 chance it would have is based upon the
25 research that you had done where you're
26 saying you're evaluating the chance that it
27 in fact could have saved the well?
28 A Yeah.

1 Q Is it based upon advice from the
2 geologist you spoke with as well?
3 A The geologist didn't -- that didn't
4 involve subsurface safety valves. That's not
5 something geologists know anything about.
6 Q Point well --
7 A That was strictly the fault.
8 Q Point well taken. Thank you. And
9 based upon advice from others who have
10 knowledge of subsurface safety valves?
11 A You know, I think my beliefs at the
12 time were based strictly on study of where
13 they were used elsewhere and reading the
14 manufacturer's publications on it, so I don't
15 know that I -- it's a unique application so
16 I'm not sure there was anyone really that
17 would have knowledge about it for use in the
18 high flow rates and with the sand production.
19 I mean there's reasons to be concerned that
20 they wouldn't have worked.
21 Q Were there any concerns that
22 something bad would have happened if they
23 were installed?
24 A Well, there was a history of when
25 they installed them in the '70s and they all
26 failed. There was a whole lot of money spent
27 and a lot of grief. The field was restricted
28 on its usage because they just installed all

1 these deepset subsurface safety valves that
2 all failed.
3 Q And to your knowledge, based on
4 your research, though, you still thought it
5 was worth trying one out at Goleta?
6 A Yes.
7 Q Why is that?
8 A Well, the technology had changed.
9 I thought it was worth trying it to see if it
10 would work.
11 Q Did you consider trying one out at
12 Aliso as well?
13 A Well, we tried one at Goleta
14 specifically because the well there was
15 considered a critical well and so it was
16 required to have a subsurface safety valve.
17 Q Okay.]
18 A And so we thought "We got to put
19 one in here. Let's try the deep-set one."
20 Q Okay. All right.
21 A And it didn't -- you know, it did
22 have some problems there; whether it would
23 have been the same if it was used at Aliso,
24 it's hard to say.
25 Q Why is that, whether it would have
26 worked the same at Aliso, it's hard to say?
27 A Well, it was installed in a
28 directionally-drilled well, which was thought

1 to be part of the problem why it didn't work
2 right.
3 Q Okay. And by directionally-drilled
4 well, can you state briefly what you mean?
5 A It's not a vertical well. It's
6 drilled at an angle.
7 Q At an angle. I see. Okay.
8 Do you have a sense how many wells
9 at Aliso are drilled at an angle?
10 A A majority of them. Not -- this is
11 a -- well --
12 Q Go ahead.
13 A -- to get into a lot of technical
14 issues that I'm not sure matter, but --
15 Q Okay. Did you consider installing
16 subsurface -- deep-set subsurface safety
17 valves in non-directional wells at Aliso?
18 A Did I consider it or -- I'm --
19 there was no -- well, the thought was "Let's
20 try it where we need to install subsurface
21 safety valves, anyway, and see how it works."
22 Q And what was the need for
23 installing them, anyway?
24 A The one at -- the well at Goleta,
25 where it was required because of the location
26 of the well.
27 Q Okay. Any -- any requirements at
28 Aliso, because of their location --

A No.

Q -- to install?

A No.

Q What was it about the location of the well at Goleta that made it required?

A It's a state law that if wells are within a certain distance of a road or a structure, they have to have a subsurface safety valve.

Q I see.

A There were no wells at Aliso that fell within that requirement.

Q Okay. Do you consider the cost-effectiveness of installing subsurface safety valves at -- elsewhere other than that one Goleta well?

A Well, the -- yeah, the overall effectiveness, including cost-effectiveness, sure.

Q Okay. And what did you come up with when you ran through the overall effectiveness? Did you think -- what did you -- would you -- did you consider, excuse me, that it would have been effective to install deep-set subsurface safety valves elsewhere other than the Goleta well?

A I'm not sure I understand the question.

1 Q To your thinking, in your role as a
2 manager in so -- at SoCalGas, was it
3 effective to install subsur- -- subsurface
4 safety valves deep-set at other wells other
5 than the one at Goleta?
6 MR. GRAVELLE: Calls for speculation.
7 MR. GRUEN: Q And I -- I appreciate
8 counsel's -- counsel's objection.
9 A Well, it doesn't seem like a very
10 clear question. I mean --
11 Q Okay.
12 A -- is it --
13 Q Did -- did you think it was
14 effective to install subsurface safety valves
15 at other wells other than the one at Goleta?
16 MR. GRAVELLE: The same objection.
17 THE WITNESS: I thought it -- well, I
18 thought it effective to install subsurface
19 safety valves only when there was a reason to
20 do it, if they were required by the state or,
21 in the case of Aliso, where there was the
22 threat of the fault. Other than the -- the
23 fault, the belief was -- and then I shared
24 it -- we didn't really need subsurface safety
25 valves.
26 MR. GRUEN: Q Okay. That's -- that's
27 helpful. I think that -- that's helpful.
28 Why don't -- Mr. Holter, do you want

1 to ask a couple of questions in follow-up
2 before we break for lunch?
3 MR. HOLTER: Sure.
4 MR. GRUEN: Okay. Go ahead.
5 MR. HOLTER: They're pretty rapid
6 enough. Thank you, Mr. Gruen.
7 EXAMINATION
8 BY MR. HOLTER:
9 Q Mr. Mansdorfer, during your
10 tenure, and from my understanding your prior
11 testimony, as -- in the role of storage
12 engineering manager, am I understanding that
13 was from 1998, roughly, to 2013?
14 A Yes.
15 Q Is that right?
16 When you took over that role in
17 1998, was it your understanding that your
18 role was to provide a program of safety for
19 the storage fields that you managed?
20 A With respect to the wells, yes.
21 Q Okay. So specifically, maybe you
22 can elaborate. What did that safety program
23 that you stated you understood to be the --
24 part of -- what is -- what did that cover in
25 the wells? I could clarify.
26 Was it from the wellhead down --
27 A Yes.
28 Q -- to the reservoir?

A Yes.
Q And that was your safety --
A Yes.
Q -- program?
A Yes.
Q So how was that -- how were you informed of that role of safety by SoCalGas? Your employer, SoCalGas. Excuse me.
A Well, I mean partially from discussions with my boss. But, I think we had annual performance plans where we wrote out, you know, what our responsibilities and goals were. But, there were -- you know, the company -- and I'm sure you've seen them. There were written -- they called them formal communication documents that set out, you know, the safety monitoring program for the wells, you know, that required that -- temperature surveys and all the different monitoring programs that were in place.
Q Was it your understanding -- thank you.
Was it your understanding that safety improvements was part of your role as storage field manager?
A Improvements is implying that things weren't safe, and I think we thought that our programs were -- if we implemented

1 them properly, provided the required safety.
2 Q Thank you for --
3 A I mean --
4 Q -- clarifying on that. This was
5 not meant to imply that it wasn't safe, just
6 that -- were you understanding that there
7 were technologies that came into being that
8 you may want to look at, and was there a
9 program of looking at technologies and to --
10 to -- as you've testified before, you saw
11 that there was a safety valve that -- at
12 Goleta that may have added a measure of
13 safety at that well; so in that vein of
14 safety improvements, not that there was a
15 deficit implied in the question.
16 A Well, I think the company always
17 encouraged -- I mean it's hard to define
18 what -- what you're saying, I think, of
19 you're required to make safety improvements
20 when you don't have anything definitive. I
21 mean I think the company did encourage
22 looking at new ways to improve safety.
23 Q Thank you. So, in light of your
24 response, we can be specific.
25 Was there a specific program during
26 your tenure regarding using subsurface safety
27 valves? You mentioned earlier there was a
28 study. Was that a formal study in your

1 group, in the well storage group, that you
2 worked on over a number of years?
3 A Well, there was a -- there was a
4 team that was put together to look at well
5 integrity and, you know, what could we do to
6 improve, yeah. You guys surely heard that
7 from other people.
8 Q Well, regarding subsurface safety
9 valves, is there a report that you summarized
10 and delivered to --
11 A No --
12 Q -- your management?
13 A -- not specifically on subsurface
14 safety valves.
15 Q Okay. So there's -- there was --
16 are you able to articulate if there was a
17 study name or -- or a program name or a
18 string of meetings that you put together and
19 had a conclusion at the end that you
20 presented to your company supervisors?
21 A Oh, I don't know if there was a
22 name --
23 Q Regarding subsurface safety valves.
24 I'm sorry.
25 A No --
26 Q This is regarding subsurface safety
27 valves.
28 A -- not regarding subsurface

1 safety valves. No.
2 Q Thank you. I appreciate that.
3 And referring to your prior
4 testimony, was the use and your -- your input
5 for sub-safety surface valve -- subsurface
6 safety valves broader than the concern for
7 the fault, or did it also cover the use of
8 the annulus for product -- production and
9 injection and the use of the annulus concerns
10 maybe regarding corrosion risks? So did the
11 subsurface safety valve come into play for
12 those two elements, using the annulus to --
13 for production, and then the aging of wells
14 for corrosion, and -- and the ability for
15 sub-safe -- surface safety valves to address
16 that, if there was ever a incident?
17 MR. GRAVELLE: I'm sorry. It's vague.
18 When you say, "come into play," do you mean
19 it was the genesis or the cause of the --
20 MR. HOLTER: Yeah. I'll re-simplify it
21 again.
22 Q Were subsurface safety valves
23 considered for a broader concern other than
24 seismic activity?
25 A They probably were. It was
26 discussed, I'm sure of it. But, I don't -- I
27 mean it's so long ago, I can't remember --
28 you know, refer to anything specifically.

1 Q So the risk of corrosion and being
2 a -- a risk concern, and then a mitigation
3 measure of surface -- subsurface safety
4 valves -- to your recollection, was that ever
5 a concern?
6 A Well, it was discussed. I think
7 the thought was the better solution to
8 concerns about corrosion is to do casing
9 integ- -- you know, a casing integrity
10 program, where you run surveys to measure
11 wall thickness and do pressure tests, just
12 like you do on a pipeline, you know.
13 Q Uh-huh. Okay. Thank you for that.
14 That's it for this subject.
15 MR. GRUEN: Okay. If we could go off
16 the record.
17 (Off the record.)
18 (Whereupon, at the hour of 12:12
p.m. a recess was taken until 2:09
19 p.m.)]
20 * * * * *
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1 AFTERNOON SESSION - 2:09 P.M.
2 * * * * *
3 MR. GRUEN: Back on the record.
4 While we were off the record, we had
5 discussed the -- with -- had some off-line
6 conversations between SoCalGas -- Gas'
7 attorney, Ms. Sabina Clorfeine, and
8 Mr. Gravelle and myself regarding the nature
9 of whether SoCalGas would release
10 Mr. Gravelle from the -- Mr. -- excuse me,
11 Mr. Mansdorfer from the confidentiality
12 agreement that Mr. Mansdorfer and SoCalGas
13 had during his time on the technical advisory
14 group in December of 2015 for SoCalGas.
15 And Mr. Gravelle, I believe you
16 wanted to -- to -- you maybe had some words
17 regarding your understanding of how that --
18 how that -- whether that issue's resolved,
19 and how so, if so.
20 MR. GRAVELLE: Right. Thank you. And
21 so, just so the record's clear, I have
22 received, this afternoon, several e-mails
23 from Sabina Clorfeine of SoCalGas confirming,
24 in writing, that Mr. Mansdorfer is released
25 from the confidentiality obligations in the
26 two-page confidentiality agreement as it
27 pertains to his testimony today in this --
28 MR. GRUEN: Examination Under Oath.

1 MR. GRAVELLE: Yeah. Yeah, this EUO.
2 And hence, based upon those e-mails, he will
3 be responding to questions regarding his work
4 as a technical advisor and information he
5 learned while serving as such, pursuant to
6 those -- to that written authorization from
7 SoCalGas.
8 MR. GRUEN: Very good. Thank you,
9 Mr. Gravelle.
10 MR. GRAVELLE: Sure.
11 MR. GRUEN: And with that, if we could
12 turn to the documents Bates stamped -- the
13 documents Bates stamped JM0033, JM0034 and
14 JM0035, and have -- identify that as marked
15 as Exhibit 5.
16 (Exhibit No. SED-05 was marked for identification.)
17
18 EXAMINATION (Resumed)
19 BY MR. GRUEN:
20 Q And Mr. Mansdorfer, if you could
21 confirm with me, do you see those -- those
22 markings, the JM --
23 A Yes.
24 Q Okay. And that appears to be an
25 e-mail from yourself to -- to a number of
26 other people on December 3rd, 2015, at
27 12:29 p.m. That is the e-mail I see on the
28 first page, JM0033. Do you see that?

1 A Yes.
2 Q And continuing on to JM0034, this
3 appears to be a dia- -- diagram, as does
4 JM0035, that you drew.
5 So, I will ask you: Are these --
6 is this -- does JM0033 contain your writing,
7 and -- first of all, is that accurate?
8 A I'd forgotten all about writing
9 this; but, yes, it was -- it was by me.
10 Q Okay. And is the diagram -- are
11 the diagrams on JM0034 and JM0035 your
12 diagrams, as well?
13 A Yes.
14 Q Okay. Regarding this, you said you
15 had forgotten about this. Do you need a
16 moment to review it?
17 A No, I just read through it.
18 Q Okay. I want to ask you,
19 generally, some questions re- -- pertaining
20 to your communications with Southern
21 California Gas Company on the mud and weight
22 for a well kill attempt pertaining to the --
23 let me back up; your discussions related to a
24 well kill attempt, flow rate, the weight of
25 the mud, pump rate, things of that nature.
26 So these -- this next set of questions is
27 related to that. Do you understand?
28 A Yes.

1 Q Okay. So let's go through, if --
2 if we can, the -- turning to the diagrams on
3 JM0034 and JM0035.
4 So could you describe, at -- at a
5 somewhat high level, what it is that these
6 diagrams are showing?
7 A Well, this -- oh, the 0034 is a
8 schematic of the well showing the casing and
9 the tubing as it existed at the time the --
10 this gas release started. There were ports
11 near the bottom of the well just above the
12 packer where the gas flowed out of the
13 reservoir, up through the packer, and out
14 those ports, and up the casing.
15 Q And when you talk about the ports,
16 you're referring to the holes in the diagram
17 that -- it looks like it says -- next to the
18 8415 --
19 A Correct.
20 Q -- feet ports?
21 A Yeah.
22 Q Okay. I see. Okay. And then I
23 see, also, there's discussion about --
24 there's -- it says -- on -- on the other side
25 of the -- the well schematic, it talks about
26 kill fluid, and it looks like it says
27 18 pounds per gallon?
28 A Yes.

1 Q At three barrels per minute?
2 A Right.
3 Q Equals 2268 pounds per minute?
4 A Yes.
5 Q Okay. And so, what do those
6 numbers represent?
7 A Well, that's the mass momentum of
8 the -- if -- if you were able to pump kill
9 fluid of that weight at that rate, that's the
10 mass mo- -- downward momentum.
11 Q So would that be, in -- in short --
12 in shorthand, would that be the flow rate?
13 A Well, the flow rate's the three
14 barrels per minute.
15 Q Okay. Okay. And so, the downward
16 momentum is the -- the 2268 pounds per
17 minute?
18 A Correct.
19 Q And so, the 2268 pounds per minute,
20 there's an arrow drawing between that and
21 8300 -- I'm sorry, 1,837 pounds per minute.
22 Do you see that?
23 A Yeah.
24 Q And what does the 1,837 pounds per
25 minute represent?
26 A Well, that's the mass flow rate of
27 natural gas flowing at the rate of 65 million
28 cubic feet per day.

1 Q Okay. And the -- again, you're
2 looking at the 65 MMCFD right above it?
3 A Right.
4 Q And that's where you're getting the
5 65 million cubic feet per day?
6 A Yeah.
7 Q Okay. Understood. So is it
8 important for the 2,268 pounds per minute to
9 exceed the 1,300 -- excuse me --
10 A Right.
11 Q -- 1,837 pounds per minute?
12 A Yeah.
13 Q Why?
14 A Well, if you got higher mass
15 momentum down than you do up, the downward
16 momentum is going to overcome the upward
17 momentum, and the kill fluid will go past the
18 ports, and the well will be killed.
19 Q So essentially, your
20 recommendation, then -- part of your
21 recommendation, in order to successfully kill
22 the well, was to have a flow rate of
23 18 pounds per gallon at three barrels per
24 minute?
25 A Right.
26 Q And you discussed that with the
27 technical advisory group?
28 A Well --

1 Q Do you recall?
2 A -- first of all, this was written
3 before I was part of the technical advisory
4 group.
5 Q That's a fair qualification. Yes,
6 I see that. So it's -- it is, indeed,
7 December 3rd, 2015. Understood.
8 So this was your discussion
9 about -- outside of the technical advisory
10 group about what would be necessary to
11 successfully kill SS-25. Is that right?
12 A Right.
13 Q And I jumped ahead. Thank you for
14 the clarification.
15 The -- in terms of, then,
16 speaking -- once you were asked to join the
17 technical advisory group, then did -- did you
18 discuss this diagram and the proposal you had
19 shown here with the technical advisory group?
20 A Well, the problem is -- is, I
21 think, I described in -- on the first page --
22 Q Yes.
23 A -- is they already precluded that
24 option, because they set a plug in the tubing
25 above the ports.
26 Q And -- and just to clarify --
27 A That's where the -- what's shown on
28 the third page.

1 Q Yes. Thank you.
2 A At the time I became part of the
3 technical advisory group, we were already in
4 the situation shown on the third page.
5 Q Okay. So if -- and the third
6 page -- JM0035. Right?
7 A Yes.
8 Q And that shows a plug inserted
9 at -- toward the bottom of the tubing just
10 above -- above the ports that you referenced.
11 Is that right?
12 A Yes.
13 Q So -- so, if I'm understanding you
14 correctly, then, the proposal -- the
15 recommendation or idea that you had to
16 kill -- successfully kill the well on JM0034,
17 the first diagram, would have worked without
18 a plug?
19 A Well, I mean there's a fair amount
20 of speculation in saying that it would work.
21 I mean I -- based on the momentum
22 calculations, it would have worked; but, you
23 know, there's some uncertainty on whether you
24 could have actually pumped that heavy a mud
25 at that flow rate. So --
26 Q Okay.
27 A So I can't say for absolutely sure
28 it would have worked. But --

1 Q Okay. But, as you said, it
2 wouldn't work without the plug -- I'm sorry.
3 It wouldn't work with the plug --
4 A Correct.
5 Q -- in place?
6 A Correct.
7 Q Because the plug is blocking the
8 flow?
9 A Yeah.
10 Q Okay. And do you know -- based on
11 conversations with the technical group, did
12 you discuss with them the -- the proposal in
13 the first diagram on JM0034?
14 A Well, that was already precluded
15 from happening by the time I became part of
16 the group. So --
17 Q Fair point. Let me ask it
18 differently.
19 Do you know if they attempted to do
20 something like what is on JM0034, based on
21 your conversations with them?
22 A Well, I don't have complete
23 information on what they did before I became
24 involved. I don't -- my understanding is
25 they'd never -- before they set the plug,
26 they never pumped heavy kill mud like that.
27 Q Okay. They pumped water?
28 A Yeah.

1 Q And would water work, in your
2 assessment?
3 A Well, it wouldn't have been my
4 choice.
5 Q Why is that?
6 A Well -- and I think they did use
7 some salt water that had some weight above
8 just straight water. But, one of the
9 problems is, if you kill the well with water,
10 the -- there's nothing to prevent the water
11 from just going -- going away, is what we
12 would say in the oil field. It would go into
13 the reservoir, and disappear.
14 Q Uh-huh.
15 A And so, then you lose your -- your
16 kill; but, also, without the weight, it would
17 take much higher pump rate to kill the well.
18 Q Okay. And so, you note in the
19 second diagram on -- on -- I'm just going to
20 call it the second diagram --
21 A Okay.
22 Q -- under JM0035, and I'll call the
23 JM0034 the first diagram. You understand
24 what I mean there. Right?
25 A Yeah.
26 Q Okay. So what the second diagram
27 has that the first one doesn't, it appears --
28 well, no. They both have the ports.

1 But, it looks as if the second
2 diagram has a second set of ports. Is that
3 right?
4 A Yeah. After they set the plug,
5 they perforated the holes in the tubing above
6 the plug.
7 Q And why did they do that?
8 A Well, to be able to circulate.
9 Q Okay.
10 A You have to circulate to kill the
11 well.
12 Q So, by circulating, you mean --
13 A Well, pumping down the tubing and
14 up the casing.
15 Q Pumping fluid down the tube --
16 pumping something down the tubing and up the
17 casing?
18 A Right.
19 Q Okay. And how did they get to the
20 point where there was a -- where they -- let
21 me back up.
22 There was -- they pumped water
23 without a plug beforehand. Right?
24 A I believe they did. Again, I
25 wasn't there, and so I was hearing bits and
26 pieces. But, I -- I'm almost sure they did
27 pump water before they set the plug.
28 Q And they didn't -- do you know,

1 from your conversations, if they pumped mud
2 before they set the plug?
3 A I don't believe they did; but,
4 again, I'm not absolutely sure.
5 Q Okay. And based on your
6 conversations, how did the plug get there?
7 At what point did the plug get there, let me
8 say?
9 A Well, you should be able to get
10 those records. I don't know.
11 Q We can. We can. Okay. Did you
12 talk -- okay. Did you get an insight -- let
13 me back up.
14 Did you learn from the technical
15 advisory group why they had put a plug in the
16 tubing?
17 A What I heard was it was Boots &
18 Coots' choice, and they didn't -- this --
19 what I describe as a port, it was an old
20 subsurface safety valve mandrel. And they
21 didn't have a picture of it. They didn't
22 know what it was. They just thought it would
23 be better not to have to deal with it, since
24 they didn't understand what it looked like.
25 Q Just a couple of clarifications of
26 that.
27 They thought it would be better not
28 to have to deal with what, since they didn't

1 know what it looked like?
2 A The old subsurface safety valve
3 mandrel, which is what I labeled as -- it had
4 the ports built into it.
5 Q Okay. So, to your knowledge, Boots
6 & Coots had not looked at the -- the -- the
7 ports, and had just gone forth with the plug?
8 MR. GRAVELLE: Objection, calls for
9 speculation.
10 MR. GRUEN: Okay.
11 Q Why don't you characterize it for
12 me so that -- because I think I didn't quite
13 capture the facts right. If -- I think I got
14 the part -- correct me.
15 I think I got the part that Boots &
16 Coots put the plug in. That was their call.
17 Am I getting that right?
18 A Well, I'm sure SoCalGas agreed to
19 it. I -- from my experience, everything was
20 agreed mutually.
21 Q Okay.
22 A But --
23 Q But, it was Boots & Coots'
24 proposal?
25 A I believe.
26 MR. GRAVELLE: I'm going to object.
27 THE WITNESS: Okay.
28 MR. GRAVELLE: I think my --

1 THE WITNESS: Yeah.
2 MR. GRAVELLE: Just so you know, my
3 concern here is he said he -- he wasn't
4 there, he doesn't know, he's just sort of
5 hearing --
6 THE WITNESS: I'm going --
7 MR. GRAVELLE: -- secondhand.
8 THE WITNESS: -- on what I heard
9 secondhand, yes, that's correct.
10 MR. GRUEN: I follow, and we don't want
11 to go there.
12 MR. GRAVELLE: Yeah.
13 MR. GRUEN: Point -- point taken.
14 Yeah.
15 Q What -- in terms of the -- the --
16 the flow rate, did you learn what the -- what
17 the -- not the flow rate.]
18 In terms of the rate that was
19 pumped down in the well, the materials that
20 were pumped down in the well, did you learn
21 what those were prior to arriving for the
22 prior well kill attempts prior to your
23 arriving?
24 A Prior to my arriving, if -- I might
25 have heard some numbers from someone that I
26 talked to, but I don't remember what they
27 were at this point.
28 Q Okay.

A And I don't know if they would have been accurate anyway.

Q Let's go to Diagram 2 and look at the plug. So you learn, when you get to the technical advisers group, that what's shown here is what you're now facing; is that right?

A Right.

Q And so what did you think should be done at that point?

A Well, I thought we should still try pumping the heavy mud and kill the well that way, which is what we did.

Q And you told the group that?

A Yeah. Yeah. We had -- there was quite a bit of debate on what to do next.

MR. GRUEN: Off the record for just a second.

(Off the record.)

MR. GRUEN: Q Back on the record. Just in terms of -- I want to ask a couple questions about Diagram 1, JM0034, just in terms of the number. So you mentioned, and I appreciate you correcting me, that this -- the numbers that you had put on this diagram were before you joined the technical advisory group for SoCalGas.

A Correct.

1 Q Okay. So how did you come up with
2 the numbers on Diagram 1?
3 A Well, based on my experience, you
4 could mix and pump mud as heavy as 18 pounds
5 per gallon and pump it at three barrels per
6 minute. I don't remember whether I made any
7 efforts to do a calculation on if that was
8 possible within the pressure limits.
9 I think, based on our knowledge, I
10 thought it was possible. Mass momentum
11 calculation is just a calculation of
12 18 pounds per gallon at three barrels per
13 minute, that's what that calculates to, and
14 the same with the gas mass flow rate.
15 Q So is that to say based on your
16 experience, this was a general calculation of
17 what you thought would work for any well at
18 Aliso?
19 A Well, it depends on the
20 configuration of each well, tubing and casing
21 size and depth.
22 Q So you used your knowledge of the
23 specifications of Access 25 in order to
24 inform these numbers in the calculations
25 shown here?
26 A Well, the casing size and tubing
27 and all that came from DOGGR's. The records
28 were all on DOGGR's website. That's where

1 those came from. I didn't have any records
2 in my possession of it.
3 Q And based on the numbers on DOGGR's
4 website that showed the specifications of the
5 well such as tubing size, casing size, what
6 have you, you then were able to come up with
7 the numbers that are shown in the
8 calculations on the first diagram?
9 A Right.
10 Q I follow. And of course that would
11 have also used your extensive background and
12 experience that you had working for SoCalGas
13 and working on the Aliso field as well;
14 right?
15 A Yeah.
16 Q I follow. I'm struggling with, you
17 know, whether this -- the rate here, the 2268
18 pounds per minute would fit within -- was
19 that -- was it possible to pump at that rate?
20 A Well, again, I don't remember
21 whether I did some -- I mean it's a matter of
22 the combination of hydrostatic pressure of
23 18 pounds per gallon mud, you know, 8,400
24 feet tall with the frictional loss of pumping
25 at that rate.
26 And I can't remember now whether I
27 did some calculations to determine that that
28 was possible or whether I just based it on my

1 previous experience that you could pump at
2 that rate, pump that heavy mud at that rate.
3 I can't -- I don't remember.
4 Q Just in terms -- we've kind of been
5 switching into accuracy of data a little bit,
6 but I want to maybe just flag this set of
7 questions in terms of data accuracy with
8 regards to well kill attempts. So that's
9 really a high level flagging of where I'm
10 going next.
11 So when you joined the technical
12 advisory group, what pump rates were you
13 observing discussed by the technical group at
14 that time?
15 A Well, are you talking about what
16 pump rates had been -- when I was working on
17 that technical advisory group, we only
18 actually made one kill attempt and it failed.
19 And, you know, every time they had attempted
20 to kill the well when it wasn't successful,
21 by then there was a big crater and the well
22 would just go all over the place.
23 They were concerned the well was
24 going to come apart. So after that kill
25 attempt I was involved with, they decided not
26 to do anymore. I was only there for one.
27 Q Okay.
28 A So there were I mean discussions of

1 different rates and different weights of
2 fluid. I mean I can't tell you at this
3 point.
4 Q From your conversations with the
5 technical advisory group, what was the source
6 of their data in order to run the
7 calculations for pump rate?
8 A Their source of data?
9 Q Yes. In other words, how did they
10 come up with the numbers underlying the
11 calcs?
12 A What numbers are you talking about?
13 Q I'm assuming that when you were
14 there, they had a pump rate that they were
15 using in order to try the well kill attempt.
16 Is that a fair assumption?
17 A That's fair.
18 Q Okay. And I'm similarly assuming
19 that they would have had -- they would have
20 used mud and had a mud density. Is that
21 fair, too?
22 A Yes. I believe that was the first
23 attempt they actually used mud.
24 Q Similarly they would have had a
25 flow rate?
26 A They -- yeah.
27 Q Okay. So those are the numbers I
28 mean.

1 A Okay.
2 Q So in coming up with the various
3 calculations to figure out all those things,
4 I'm asking about sources of data underlying
5 the calculations.
6 In your conversations with the
7 technical advisory group, did you learn the
8 sources of data that were used in order to
9 come up with the numbers that were plugged
10 into the calculations?
11 A You're still confusing me when you
12 say "sources of data." I mean you're talking
13 about -- you can do a calculation for any
14 weight or pump rate. So I mean I'm sure
15 there were different numbers that were --
16 Q Yes. It's based largely upon the
17 understanding of the flow rate; right? And
18 you're trying to overcome the flow rate?
19 A The flow rate of the gas?
20 Q Correct. Am I following? Am I
21 understanding that correctly?
22 Go ahead, Mr. Holter. Why don't we
23 switch gears and have Mr. Holter ask a few
24 questions specifically regarding the
25 underlying data.
26 MR. HOLTER: Fair enough. Thank you,
27 Mr. Gruen.
28

1 EXAMINATION (RESUMED)
2 BY MR. HOLTER:
3 Q Mr. Mansdorfer, when you came to
4 the site, were you given a set of assumptions
5 on reservoir pressures, flow rates, well
6 isolations to start up your assessment of
7 where they were roughly and what was the date
8 specifically you began doing that?
9 There's two questions there. What
10 was the date you did it and then were you
11 given a set of data, well data and reservoir
12 data, on that date?
13 A Well, I don't remember the exact
14 date. Somewhere that should be available, I
15 mean SoCalGas has it. I mean it was sometime
16 after the 7th. I don't think it was too long
17 after that.
18 Q Within a week would you say?
19 A Yeah, yeah.
20 Q All right. So within a week of
21 December 7th, were you given a set of
22 assumptions data and in that data set were
23 you given reservoir pressures, flow rates of
24 wells, including SS-25 to assess the
25 situation?
26 A Well, I was given pressure on the
27 nearby wells. You know, I think the actual
28 flow rate on SS-25, there was obviously no

1 way to actually measure it so there had to be
2 some assumptions on that but --
3 Q And what are those assumptions
4 based on? Prior flow rates when the well is
5 in control?
6 A Right.
7 Q Is that what I'm understanding?
8 A Yeah.
9 Q Were you given a set of data to
10 review of when that --
11 A I believe I was, yeah.
12 (Crosstalk.)
13 THE REPORTER: I need that question
14 again, please.
15 MR. HOLTER: Q Were you given a set of
16 data to review of when that well was in a
17 controlled state?
18 A I believe I was, I think.
19 Q And as an additional question
20 parallel to that, is that a standard set of
21 data that you had experienced reading when
22 you were storage field manager, data you were
23 familiar with?
24 A Yes.
25 Q So that was easily accessible data?
26 A Yes.
27 Q What is the name of that group of
28 data that you manage when you were storage

1 field manager? Like a monthly storage filled
2 flow rate from wells? What would be the
3 name? I'm giving you a suggestion.
4 A The name of it. I don't -- I don't
5 know what you're getting at.
6 Q Flow rates on each well, production
7 well?
8 A Right.
9 Q Each well has --
10 A It's just -- it's flow rate on a
11 well.
12 Q Okay. So is there -- when did you
13 gather that in the field during your tenure
14 as storage field manager?
15 A Well, that data was collected at
16 different times for different purposes. We
17 did periodic tests on each well and that was
18 generally put in a permanent record as the
19 field engineer -- when I was the field
20 engineer there almost daily I had the field
21 operators when they turn the well on or off,
22 they checked the change in rate at the main
23 flow meter and they would, you know, they
24 kept a record of when they turned the wells
25 on or off, what the pressure at the well was,
26 and the change in flow rate at the main flow
27 meter.
28 So by the rate of difference, you

1 could get a rough -- I mean pretty close flow
2 rate on the well.
3 Q Okay. Now, is that flow rate
4 you're speaking of right now, is that the
5 rate that you were given when December 7,
6 2015, you showed up? Was that data you were
7 given in the data set?
8 A Well, I'm sure one of the pieces of
9 data I was given was the test records from
10 the well.
11 Q When you were given that data, was
12 that familiar to you from your experience
13 and --
14 A Yes.
15 Q -- standard information?
16 A Yes.
17 Q Okay. Were there any exceptions or
18 missing parts to that data that you noticed
19 when you showed up?
20 A Not that I can recall at this time.
21 Q So you had all the data you
22 needed --
23 A Yes.
24 Q -- for your professional
25 understanding?
26 A Yes.
27 Q Is that my understanding?
28 A Yes.

1 Q A week after December 7, 2015?
2 A Yes.
3 Q Thank you.
4 Go ahead, Mr. Gruen.
5 MR. GRUEN: Thank you, Mr. Holter.
6 EXAMINATION (RESUMED)
7 BY MR. GRUEN:
8 Q So you talked about getting a data
9 set gathered on a regular basis in order to
10 determine the flow rate. Did I capture that
11 right?
12 A Right.
13 Q Was there other data that was
14 necessary to gather in order to calculate the
15 flow rate of the wells at Aliso other than
16 what you just told us?
17 A No.
18 Q I think you talked about you could
19 get a rough understanding of the flow rate by
20 the data gathering points, and forgive me
21 because of my limited technical
22 understanding. I didn't track exactly what
23 you had said to gather the data.
24 What was the term you used in order
25 to get a rough understanding of the flow
26 rate?
27 A Rate by difference.
28 Q Rate by difference, okay. So rate

1 by difference and that's gathered at each
2 wellhead?
3 A No, it's at the main meter.
4 Q Main meter.
5 A You have 10 wells flowing and the
6 flow rate is 200 million cubic feet a day.
7 You take one well off and the new flow rate
8 is 180 million cubic feet a day.
9 Q Okay.
10 A Common sense tells you that well
11 was making 20 million cubic feet a day.
12 Q Okay. And the main meter, is there
13 one main meter for each well then?
14 A No. The main meter for the field.
15 Q For the field. And so the main
16 meter of the field is -- by getting a reading
17 of the main meter for the field, you're able
18 to tell the flow rate into each well; is that
19 right?
20 A When you turn the well on or off,
21 the rate by difference.
22 Q And the main meter -- so I think
23 maybe a factor I'm missing. Is the main
24 meter gauging reservoir pressure?
25 A No, flow rate.
26 Q Flow rate. And flow rate is not a
27 function of reservoir pressure then?
28 A Well, flow rates, it's a

1 matter of -- I mean it does change as
2 reservoir pressure changes, but it's how many
3 wells are on and what's the tote size in each
4 well.
5 Q Okay. Do you need anything more
6 than you're reading from the main meter in
7 order to tell the flow rate at a given well?
8 A Well, you need to rate by
9 difference. You need to turn that well on or
10 off.
11 Q If you turn -- got it. The rate by
12 difference is measuring the pressure of
13 adding or subtracting one more well?
14 A It's not the pressure, the flow
15 rate.
16 Q The flow rate by adding or
17 subtracting one more well?
18 A Right.
19 Q Thank you. So you're able to tell
20 the flow rate of any given well by looking at
21 the main meter and turning that particular
22 well on or off?
23 A Right.
24 Q I follow. Would you turn given
25 wells on or off in order to check rate by
26 difference and the accuracy of it at given
27 points in time then?
28 A Well, the most common data, which

1 was not necessarily kept as a permanent
2 record was when, you know, there's a gas
3 control for SoCalGas and they would call each
4 storage field and say increase your
5 withdrawal rate by 200 million cubic feet or
6 decrease it.
7 And so when they go turn wells on
8 or off to meet that increase or decrease,
9 that's when you would just have them get the
10 rate by difference and they'd, you know, at
11 8:01 they'd turn off well X and the rate
12 drops by 20 million so you know that well is
13 doing approximately 20 million.
14 Q Yes, I --
15 A But there were some -- we did do
16 periodic tests and we called them sand tests
17 where we were checking to make sure each well
18 wasn't producing too much sand, which would
19 be erosive. And during that, those were kept
20 as more formal records. I mean the flow rate
21 was determined the same way, by difference,
22 but it was kept as more of a permanent
23 record.
24 Q So you had periodic data points of
25 rate by difference based on different times
26 when you turned a well on or off?
27 A Yeah.
28 Q Was your basis of turning the wells

on and off responding to demand?

A Yes.

Q Did you ever do it for other reasons?

A Well, only those sand tests I described, you -- we put a probe in a well, flow it for a certain number of hours, and it was turned on or off, you know, at the start and beginning of the six-hour period.

And so they would have to put on a separate well to make up -- because they had to keep the rate more or less what they were being called for. So that was the only time you would turn a well on or off only to get the rate, which is part of a test.

Q And how did you decide which wells to turn on or off in order to test rate by difference?

A Well, for the sand tests I was just describing?

Q Yes, for the sand tests.

A Well, I mean you try to get a periodic test on every well but there were some wells that were known to be more of a sand producer and so those got more frequent tests.

Q I think where I'm trying to go with this is was there a methodology in order to

1 calculate the rate by difference of given
2 wells at Aliso?
3 A Yeah. I mean I think the data that
4 we had on the rates of the wells was pretty
5 accurate. That wasn't an issue with not
6 killing the well.
7 Q Okay. And you had records of the
8 rate by difference in terms so that you could
9 tell essentially the flow rate of given
10 wells?
11 A Yeah.
12 MR. GRUEN: Mr. Holter, anything you
13 want to ask on that line, anything else?
14 MR. HOLTER: Yeah, just a follow-up.
15 EXAMINATION (RESUMED)
16 BY MR. HOLTER:
17 Q Mr. Mansdorfer, when it comes to
18 SS-25 and the flow rate on that, are you able
19 to remember if it was online and flowing when
20 it produced the incident?
21 A You know, I wasn't involved with
22 that. My -- this is just an impression. It
23 was not flowing at the time it happened, but
24 I don't know that for a fact. I mean, again,
25 that's something you should be able to get a
26 record from SoCalGas.
27 Q Yeah, thank you for that.
28 A They know.

1 Q No, you're right. And it's not to
2 compare your testimony with the record. It's
3 more just what you knew coming into it. And
4 you have experience to understand what data
5 you have.
6 So I would like to ask this: Do
7 you have -- is it important or was it a
8 concern of yours how long it had been
9 off-line or online or not been producing?
10 Was that something you factored into your
11 consideration?
12 A No.
13 Q And when a well is off-line and not
14 able to come online and join in with the mass
15 meter down a hill, is there a method at Aliso
16 Canyon to measure the flow rate of a well or
17 what it potentially would be other than the
18 historical flow rates? Is there a
19 methodology to isolate a well and do a flow
20 rate test on it when it's not online?
21 A Well, the only way to flow test a
22 well is through the gas gathering system
23 that's there. It's not online. I don't
24 understand.
25 Q Well, it's not a trick question.
26 A I mean bullet to the atmosphere?
27 Is that what you're talking about?
28 Q Did they do --

A No.
Q -- a quick blowoff --
A No.
Q -- or did they blow into a mechanical -- okay.
A No.
Q So it's all through the gathering system?
A Yeah.
Q There was no underlying intent there other than just is there a mechanism there to it, isolate it.
A No.
Q Okay. That's it, thank you.

EXAMINATION (RESUMED)

BY MR. GRUEN:

Q Switching topics if we can, I want to ask -- do you want to go off the record for a moment?
MR. GRAVELLE: Yes.
MR. GRUEN: Off the record.
(Off the record.)
MR. GRUEN: Q Thank you, Mr. Mansdorfer. I want to ask you some questions about cathodic protection of the wells at Aliso. So with that understanding, just that's where this next set of questions is headed.

1 Are you familiar with Frank Selga?
2 A Yes.
3 Q How do you know him?
4 A I worked with him.
5 Q When?
6 A Oh, I --
7 Q Approximately.
8 A Well, it was -- I don't know. I
9 mean it was toward the end of my career with
10 SoCalGas.
11 Q So prior to the incident?
12 A Yes.
13 Q And what does the term "cathodic
14 protection" mean to you?
15 A Well, it means draining current
16 from a metal structure to make it a cathode
17 rather than an anode so that it doesn't
18 corrode.]
19 Q Thank you. We understand, from
20 Mr. Selga, that there were two wells at Aliso
21 that had been cathodically protected. Is
22 that accurate? Can you confirm that?
23 A Well, I think there were at least
24 two, yeah.
25 Q Okay. Do you recall there being
26 others?
27 A I don't -- I mean it was a limited
28 number, but I don't know exactly how many.

Q And who decided to cathodically protect the -- the wells at Aliso?

A Those two wells, you're referring to?

Q The two wells that I'm referring to, yes.

A Well, I think it was a group decision, but I -- I think I was involved in it.

Q Okay. Do you recall approximately when the decision was made to cathodically protect the two wells?

A I don't know. You ask me these timeframes, and I -- you know --

Q Long --

A -- it's a long time ago --

Q A long time.

A -- and a lot of things have happened, I --

Q That's --

A -- mean, and you should be able to find those dates. I don't know why you ask me.

Q It's -- it's a reasonable response to -- to say it was a long time ago. I get it. We're not trying to test your memory from years back.

A That's what it feels like.

1 Q I can't remember what I ate
2 yesterday.
3 What we're trying to get at,
4 really, is the -- the basis of the decision
5 to cathodically protect certain wells, but
6 not others.
7 A Right. Well, they were in a -- the
8 very eastern part of the field where there
9 was an apparent corrosion problem that didn't
10 apply to the rest of the field, which we had
11 theories about why that was. But, yeah.
12 And, you know, I assume Frank or whoever else
13 you've talked to has told you the reasons why
14 cathodic protection wasn't applied to all the
15 wells in the field.
16 Q Can you give us your understanding?
17 A Well --
18 Q You talked about the theory, and
19 that's helpful. If you could explain it at a
20 high level to us, the basis for cathodically
21 protecting certain of the wells, but not
22 others.
23 A Well, I mean the original decision
24 not to apply cathodic protection at Aliso
25 Canyon was because SoCalGas only owned some
26 of the wells, and there were other owners of
27 other wells, and if you apply cathodic
28 protection to some wells, and not all of

1 them, you can actively cause corrosion on the
2 ones that aren't protected.
3 Q Okay.
4 A So they were trying to avoid doing
5 harm to property they didn't own, was -- is
6 my understanding. I mean, you know, that was
7 a decision that was made early in the
8 conversion of the field to gas storage.
9 Q So -- so it wouldn't have been
10 possible to cathodically protect all of the
11 wells, because -- at least, not from a
12 SoCalGas decision-making standpoint?
13 A Right.
14 Q Okay. And had SoCalGas done so,
15 I -- I think what I'm hearing is that there
16 would have been corrosion on -- or the -- the
17 threat of corrosion, at least, on
18 non-SoCalGas --
19 A Right.
20 Q -- wells? Okay.
21 Was there a concern about a threat
22 of corrosion on non-SoCalGas wells based on
23 the cathodic protection of the -- the two
24 wells that were --
25 A Well, the two wells were on the
26 very eastern part of the field. They were
27 pretty much by themselves.
28 Q Uh-huh. Okay. Did SoCalGas ever

1 communicate with the other owners at the
2 field at Aliso about cathodically protecting
3 all of the wells?
4 A Well, I don't know. That was a
5 issue that was decided early in the life of
6 the field, before I was there.
7 Q Would it have been an option? Did
8 you consider anything like that while you
9 were there?
10 MR. GRAVELLE: I'm sorry. When you
11 say, "like that," what are you referring to?
12 MR. GRUEN: Yeah. Anything -- let me
13 restate the whole question. Fair point.
14 Q The -- did you -- during your
15 tenure, your 15-year tenure as manager, I
16 think storage field manager, if I understood
17 correctly, did you consider having SoCalGas
18 communicate with the other owners at Aliso
19 about cathodically protecting all of the
20 Aliso wells?
21 A No, I don't think that was
22 considered.
23 Q Okay. We understood generally from
24 Mr. Selga that there was communication about
25 a lack of O2 in the field, which would be a
26 source of a threat of corrosion; and I hope
27 I'm not misstating this, but that is our
28 understanding of -- of part of the reasoning

1 that went into not doing cathodic protection.
2 A Well, yeah, that's right. I mean
3 if you don't have oxygen in the water, in the
4 subsurface water, you're not going to have
5 corrosion. And that's -- I didn't get into
6 the details, but on the very eastern part of
7 the field, the formation dip is different
8 than the rest of the field, and there's -- it
9 dips to the surface, so rainwater, that
10 carries oxygen, can get down to the wells.
11 The rest of the field, that's not the case.
12 And, in fact, there's -- there is no history
13 of external corrosion on the rest of the
14 field. So that was one of the reasons why we
15 didn't see any driver to -- and besides that,
16 cathodic -- cathodically protecting wells
17 is -- it's not like a pipeline where you can
18 go take pipe-to-soil readings and know you're
19 protecting it. You can't go a thousand feet
20 in the well, take the pipe-to-soil reading.
21 So it's very questionable how much -- how
22 deep is the current going, are you really
23 protecting the well. So --
24 Q Okay. And -- and with regards to
25 the history of corrosion in the field --
26 A Uh-huh.
27 Q -- if I understood you right, you
28 mentioned that there's no history of

1 corrosion in -- in --
2 A Well, when I say, "no," in general,
3 there's not a -- there's not a history of
4 significant external corrosion, other than on
5 the very east side, where I described it.
6 Q And in order to know that there's
7 not a history of -- did you say significant
8 metal corrosion?
9 A Yeah.
10 Q I want to be sure I'm getting your
11 words right. Not a history of significant
12 metal corrosion.
13 Were there tests done?
14 A Oh, absolutely. I mean we had a
15 policy, whenever we had to pull a well -- you
16 can't -- you know, you can't run a casing
17 inspection log when it's got tubing in the
18 well, like, you know, because you have to
19 have access to the whole cross section of the
20 casing. So, unless you have a rig on the
21 well and pull the tubing, you can't run a
22 casing inspection log. But, our policy was,
23 when we had to pull the tubing for some other
24 reason, we ran a casing inspection log, which
25 gave you the wall thickness of the casing.
26 Q Uh-huh. And -- and so, that is to
27 say that you didn't find metal loss on the
28 wall thickness of the casing when you

1 pulled --
2 A That's right, yeah.
3 Q -- for those --
4 A Yeah.
5 Q -- pieces that you pulled?
6 A Yeah.
7 Q Okay. I follow.
8 A In general. I mean sometimes you'd
9 see a little -- you know, you can have wall
10 thickness for various reasons; most one --
11 common one is drill pipe wear. You know, if
12 you're drilling -- like on this well, they
13 set casing here, and then they drilled
14 through it. So that drill pipe's turning
15 inside the casing, and you can have drill
16 pipe wear. But, cathodic protection wouldn't
17 do you any good with that.
18 Q Because you're talking about --
19 A That happened when it was
20 originally drilled.
21 Q Originally drilled, and, to boot,
22 it's internal, and not external?
23 A Right. Yeah.
24 Q Okay. So -- so you didn't see --
25 I -- I just want to get my head around this,
26 because I think I've got the picture.
27 But, you didn't see, when you --
28 for any of the casing that was pulled,

1 there's no documentation showing any -- any
2 corrosion on -- on the -- on the casing?
3 A Well, I mean the casing is almost
4 never pulled. What I was referring to was
5 the casing inspection logs, where you can run
6 a tool on wireline down the well, and it
7 measures the thickness of the casing.
8 Q Okay.
9 A And I'm just saying, in general,
10 no, we didn't see a corrosion problem on the
11 wells there.
12 Q Okay. Did you see any exceptions
13 to -- where there were examples of corrosion?
14 A Well, on the east side, we saw it
15 there; other than that, I don't recall.
16 Q Okay. Okay. Thank you.
17 Mr. -- yeah.
18 MR. HOLTER: I can go ahead, if you
19 want me to.
20 MR. GRUEN: Yeah. Yeah. Go ahead,
21 Mr. Holter.
22 MR. HOLTER: Thank you, Mr. Gruen.
23 EXAMINATION (Resumed)
24 BY MR. HOLTER:
25 Q So Mr. Mansdorfer, regarding the
26 logging that you -- you spoke of on the
27 casing, what -- which casing are we referring
28 to, when you say, "casing"?

A Well, the casing that can find well pressure.

Q So would this be like a standard annulus casing, where production gas was being used for it?

A Right.

Q Are those generally a size of like five inches to, say, eight or nine inches? Is that what they are?

A Well, most at Aliso were seven-inch or eight and five-eighths or nine and five-eighths.

Q And do -- and do they travel -- or are they installed in a borehole from surface to the reservoir?

A Yes.

Q And the tubes are encased within that casing, the annulus casing?

A The tubing, yes --

Q Tubing.

A -- inside there.

Q And then -- so all the logs you're talking about are run in that casing. Is that right?

A Right.

Q And that checks for both interior metal loss and exterior metal loss, which would include possible corrosion, exterior

1 corrosion. Is that right?
2 A Right.
3 Q Did you also -- moving to the outer
4 casing, the surface casing, which the purpose
5 of the surface casing is, in your words, to
6 what?
7 A Well, it's really -- well, it's
8 mainly for the drilling of the well. It
9 doesn't serve a whole lot of purpose after
10 the well is drilled and cased.
11 Q It's -- it's --
12 A Well, it's the anchor for the
13 blowout prevention equipment. It -- you
14 know, in some locations, it serves to protect
15 fresh water. But, it -- and it, you know,
16 provides return of drill mud to the -- to the
17 tanks. But, it's mainly an anchor for the
18 blowout prevention equipment.
19 Q And in our review of the records,
20 it looks like those surface casings are
21 either -- are run from about 500 to
22 1200 feet, roughly --
23 A Right.
24 Q -- in that range.
25 A Yeah.
26 Q Is that correct?
27 At any time, did you log surface
28 casings to check for exterior threats in your

1 time at -- as storage field manager?
2 A Well, there was -- there was no
3 way, that I know of, to log the surface
4 casing after the primary casing string has
5 been run inside of it.
6 Q No technologies or -- what about
7 when you abandon a well, do you ever remove
8 parts of the casing, of the seven-inch
9 casing, the six-inch casings, so that you now
10 have access to surface casing?
11 A That's one way of doing a well
12 abandonment, yeah.
13 Q Did you do some well abandonments
14 like that when you work -- worked there from
15 1998 to 2013?
16 A You know, I -- offhand, I can't
17 remember abandoning any wells at Aliso Canyon
18 during that time. We did some at other
19 fields, but I don't remember doing one at
20 Aliso.
21 Q Uh-huh.
22 A I'm not saying we didn't, but I
23 just don't remember doing any.
24 Q So in the documents that we
25 subpoenaed, you mentioned your thoughts of
26 exterior corrosion being a cause or a
27 possible cause. What would lead you to that
28 statement, what makes you think of that?

A Ah, well, just because I -- based on what I knew at the time, I didn't know of any other possible cause that could have caused it.

Q Is that based on your experience from working there, that corrosion is a possible cause of a whale -- a well incident, losing well control or integrity of the well borehole?

A Yeah. There's a limited number of ways you can lose subsurface control, and, yeah, corrosion -- even though, like I said, there wasn't really history of it; but, that's not to say there couldn't be some unique situation at a given well. And I mean I am not privy, but there -- I know there's been a root cause analysis. They recovered casing. Somebody should know by now what the real cause of the leak was here.

Q So I think that's -- you're right on.

The questions here is -- is when -- when you were removing casings, was there a data assessment of --

A Well, we didn't remove casings, at Aliso, anyway.

Q Uh-huh.

A We did a few -- during my time, we

1 did a few abandonments at Playa del Rey. And
2 there's a shallow gas zone there, which is
3 the reason why we would cut the casing off
4 just above the shoe of the surface casing,
5 and pull it out, so we could cement the
6 surface casing from the shoe up. But, I
7 don't recall ever doing that at Aliso Canyon.
8 Like I said, I don't even remember plugging
9 any wells at Aliso.
10 Q When you're running a log, does the
11 log also have the ability to do like a -- a
12 double penetration to the outer 11 and
13 three-quarter casing?
14 A No.
15 Q How would you assess a surface
16 casing's integrity, if it's put in in 1946,
17 and to see if it is, indeed, having any
18 exterior --
19 (Crosstalk.)
20 THE WITNESS: Well, in my judgment, the
21 surface casing, like I said earlier, serves
22 minimal function, once you've run and
23 cemented the primary casing. I mean it's set
24 too shallow to contain gas pressure. It just
25 doesn't really serve any real function. So
26 it was never something that -- of concern.
27 MR. HOLTER: Q So it doesn't serve a
28 purpose of like a environmental barrier, say,

1 from exterior corrosive fluids or any type of
2 crystalline growth or anything from the
3 exterior borehole? It doesn't serve anything
4 from that?
5 A Well, I could -- it wasn't
6 something I'd given a lot of thought to, but
7 I mean it -- it -- I won't say it's not
8 possible that it does kind of protect the
9 primary casing string. It could.
10 Q Is -- this is going back to your
11 statement about -- is that what, indeed,
12 is -- the well's hung on, or is it -- is the
13 well hung on the -- the conductor casing?
14 I'm -- I may have a misunderstanding about
15 the well --
16 A Well, the -- yeah, the --
17 Q -- engineering there.
18 A The primary casing is -- is
19 generally hung on the surface casing.
20 Q And then, what is the conductor
21 for?
22 A That's strictly for drilling.
23 That's just -- when you're drilling the
24 surface hole, that's to provide mud returns
25 to the tanks.
26 Q Uh-huh. So am I hearing you
27 correctly when you're saying that the surface
28 casing is primarily a foundation structural

1 component, and not so much a protector
2 annulus --
3 A Right.
4 Q -- for the rest of it?
5 A Right.
6 Q Okay. But, indeed, it's vital for
7 the integrity of the well, because
8 everything's physically hung on it?
9 A Well, you could look at it that
10 way. I just -- I've never heard of a well
11 failing because the surface casing failed.
12 That's just not something I've ever heard of.
13 It was never something I'd heard anyone have
14 concern about.
15 Q Thank you for that.
16 So while -- my question is: Is
17 there any wells that are built with a
18 conductor, and no surface casing, because
19 there's no groundwater, and then it goes
20 straight to annulus?
21 A Well, I don't know about storage
22 wells, but I can tell you -- I mean some of
23 the oil wells I operate right now were
24 drilled that way, yes.
25 Q Okay. So what's your thoughts on
26 why SoCalGas would spend good hard-earned
27 money to drill a surface casing, if they may
28 or not -- may not be vital?

A Well, you have to have it to --

MR. GRAVELLE: Objection, calls for speculation.

THE WITNESS: Oh, I think it's a pretty straightforward answer.

You have to have surface casing, like I said earlier, to put the blowout prevention equipment on. I mean it's state law you have to have blowout prevention equipment, and DOGGR determines the depth of the surface casing in each field.

MR. HOLTER: Q So --

A But, it's primarily for drilling, like I said.

Q I got you. So blowout prevention is for drilling or production, blowout prevention?

A For drilling.

Q Okay. So after the drilling's done, its use is pretty much intact, and not necessarily a production necessity?

A Right.

Q Okay. I -- I appreciate you clarifying that. So --

MR. GRUEN: Thank you. Let's switch gear --

MR. GRAVELLE: Do you want to take a break? Five-minute break?

1 THE WITNESS: Okay.
2 MR. GRUEN: Let's go off the record
3 five minutes.
4 (Off the record.)
5 MR. GRUEN: Let's go back on the
6 record.
7 EXAMINATION (Resumed)
8 BY MR. GRUEN:
9 Q Mr. Mansdorfer, on -- if you would
10 turn -- I think it's the e-mail in front of
11 you, JM0033 to JM0035. And if memory serves,
12 I think that is --
13 MR. GRAVELLE: Five.
14 MR. GRUEN: Exhibit 5. Thank you.
15 Q So if you would turn --
16 MR. HOLTER: That's five.
17 MR. GRUEN: Thank you.
18 MR. HOLTER: That's five.
19 MR. GRUEN: Q If you would turn --
20 actually, stay on JM0033, and it's the one,
21 two, three -- fourth paragraph down. And
22 I'll read it.
23 "As of now, their plan for the
24 relief well seems to be to try
25 to actually intercept and mill
26 into the blowout well casing -
27 that is why they are saying 3 to
28 4 months. I don't think that is

1 necessary - if they can get within
2 20 feet in the right direction from
3 the well they should be able to kill
4 it, and this would take more like
5 3 - 4 weeks rather than 3 - 4
6 months."
7 Do you see that?
8 A Yes.
9 Q And -- and that's -- I think I
10 asked this before, but that's your writing.
11 Right?
12 A Yes.
13 Q So, as you might gather, but just
14 for the record, this is -- these questions
15 are about the timing of drilling the relief
16 well.
17 A Okay.
18 Q Did you talk to -- when you joined
19 the technical advisory group, did you talk to
20 SoCalGas about this approach?
21 A I was -- it was made clear to me I
22 was not involved with the relief well. I was
23 there for the last kill attempt on SS-25, and
24 that was it.
25 Q And that was it. Okay. Did -- so
26 you weren't given an opportunity to talk to
27 them about a quicker way to do a relief well?
28 A No.

1 Q Okay. Had you been allowed to talk
2 to them about a quicker way to drill a relief
3 well, do you think it could have been
4 expedited?
5 MR. GRAVELLE: Objection, calls for
6 speculation.
7 THE WITNESS: Yeah, I don't -- I don't
8 know.
9 MR. GRUEN: Q Okay. Do you know if
10 SoCalGas -- but, SoCalGas, to your knowledge,
11 did -- let me ask -- I don't want to cross
12 the speculation line. He's right.
13 Do you know what method SoCalGas
14 used in order to drill the relief well? Do
15 you know?
16 A What method?
17 Q What approach they used. Let me
18 ask it this way. I'll rephrase.
19 Do you know if SoCalGas took the
20 approach that you proposed in this e-mail?
21 A I don't think they did. But, like
22 I said, I wasn't involved.
23 Q Okay. What's your basis for saying
24 if -- if they can get within 20 feet in the
25 right direction from the well, they should be
26 able to kill it?
27 A Well, because of the reservoir's
28 high permeability, water flows easily through

1 it, and if they -- I would have drilled, you
2 know -- you have some target where you think
3 the well is at, but you never know, for sure;
4 so you have a radius of uncertainty. I would
5 drill to the uphill side. The reservoir's on
6 a dip. Water flows downhill. So you'd want
7 to be above it, not below it.
8 Q Uh-huh. And what's the benefit of
9 being above the -- the well rather than
10 below?
11 A Because water flows downhill.
12 Q And -- and -- and therefore --
13 I'm -- I'm sorry. And, in my non-technical
14 understanding, I got the water flows downhill
15 part.
16 But, what does that -- what's the
17 advantage of water flowing downhill when
18 you're trying to drill a relief well uphill
19 of the actual well?
20 A Well, the purpose of the relief
21 well is to pump fluids to the blowout well.
22 Q Right. Yeah. Okay.
23 A So you want the water to go from
24 the relief well to the blowout well.
25 Q Thank you for connecting the dots.
26 I appreciate that.
27 So, this sounds like a common sense
28 approach. It's based -- it's common sense,

1 based on your experience working on the Aliso
2 field. Am I characterizing that fairly?
3 A Well, it's -- it is. Although, you
4 know, there's a fair amount of speculation on
5 my part when I wrote that, because I had
6 never actually been involved in doing an
7 operation like that.
8 Q Okay.
9 A So, yeah. I mean I --
10 MR. HOLTER: Excuse me. Just a
11 clarification.
12 I want to make sure when you're
13 speaking uphill/downhill, are you speaking of
14 through the cap rock, and into the formation?
15 THE WITNESS: No. No.
16 MR. HOLTER: Could you clarify where
17 you're talking about within the well?
18 THE WITNESS: Just within the
19 reservoir. The reservoir's at a dip. Right?
20 20-degree dip or something. So the -- you
21 could drill on the updip side of the blowout
22 well.
23 MR. GRUEN: Okay. Okay.
24 MR. HOLTER: Thank you.
25 MR. GRUEN: Q So what part of this
26 is -- what part of this statement is based on
27 speculation, then?
28 A That you could kill the well, if

1 you could get within 20 feet of it. I mean I
2 don't know, you know -- that's one area where
3 Boots & Coots has a lot of experience. They
4 very well have a -- maybe have a way to
5 calculate if you could kill the well.
6 Q Yeah.
7 A If they know the reservoir
8 permeability and thickness and gas flow rate,
9 it's probably possible to calculate could you
10 actually -- how close do you need to be to
11 kill it.
12 Q But, you don't need to actually
13 drill into the well to kill it, in your
14 understanding?
15 A I wouldn't think so. But, again,
16 it's not an area I really have expertise. So
17 I mean I -- some of this stuff I wrote trying
18 to get discussion going, as much as anything.
19 Q Did you get any response at this
20 point?
21 A Not a whole lot, no.
22 Q Okay.
23 A I think most of these people were
24 smarter than I was about putting stuff in
25 writing.
26 Q Well, I don't know about the
27 writing part, but I -- I like to work with
28 people who are smarter than I am, too.

1 Usually, I -- I tend to try and put stuff in
2 writing, like you do, Mr. Mansdorfer;
3 although, there are exceptions.
4 Okay. What were the backgrounds of
5 the folks on this e-mail, generally speaking,
6 do you know?
7 A They're different people I worked
8 with in the oil field over the years.
9 Q Okay. All right. Thank you.
10 Switching to another topic that
11 the -- I think we're back to Exhibit 1, which
12 is -- has JM0005 at the bottom.
13 MR. GRAVELLE: I believe that's
14 Exhibit 2.
15 MR. GRUEN: Exhibit 2. Thank you for
16 the clarification.
17 Go off the record a second.
18 (Off the record.)]
19 MR. GRUEN: Back on the record. So in
20 the e-mail you state -- I'm looking for it
21 but, yeah, it's the fourth paragraph down.
22 It's the two-line paragraph.
23 "Also, there are multiple reasons
24 why the interest and incentives in
25 Boots & Coots are not aligned with
26 those of SoCalGas and so putting
27 complete control in their hands may
28 not be in SoCalGas' best interest."

1 Do you see that?
2 A Yes.
3 Q What did you mean when you wrote
4 that statement?
5 A Well, I just think the longer Boots
6 & Coots is there, the more money they're
7 making. You know, they obviously want to get
8 the well killed at some point, but I don't
9 think they necessarily had the same urgency
10 that other people had. That was the only --
11 it was speculation really.
12 Q Anything else?
13 A No.
14 Q With regards to the e-mail and
15 Boots & Coots being present at Aliso to kill
16 SS-25, what is your understanding of the
17 underlying historical relationship between
18 Boots & Coots and SoCalGas at Aliso Canyon if
19 any?
20 A Well, you're asking me a question
21 I'm pretty sure you should have been able to
22 get answers from SoCalGas, but I think the
23 well control insurance that SoCalGas has may
24 have required Boots & Coots to be called when
25 there's a problem, well control problem.
26 Q Thank you. Let's do a set of
27 questions regarding storage well integrity.
28 If we go to JM0031 and if somebody has the

exhibit number of that one, I would be grateful.

MR. HOLTER: It was 4.

MR. GRUEN: Q Exhibit 4, do you have that in front of you?

A Yes.

Q In the first paragraph starting in the second sentence and I'm reading,

"Most likely just corrosion. The well is 70 years old. This was a concern of mine for a long time, and I had recommended a storage well integrity program to put a rig on each of the storage wells and run casing inspection logs, and ironically, SoCalGas recently got CPUC approval to include this program and associated costs in rates charged ratepayers, but the authority to include rates hasn't taken effect yet and so they have been waiting to start it. In other words, they knew it was needed but haven't started it because they couldn't yet collect it in rates!"

You wrote that; correct?

A Yeah.

Q Generally speaking at a very high

level, I'm not trying to pin down dates, but I am going to ask you a when question again. Do you have a general rough understanding of approximately when you first recommended a storage well integrity program to SoCalGas?

A Well, I think 2009.

Q Okay. And in some level of detail, if you would, what did you recommend when you recommended a storage well integrity program to SoCalGas in 2009?

A Well, just to have a structured program where we have a schedule that will eventually result in a casing inspection and pressure test for every storage well.

Q And who did you recommend that to?

A My boss at the time.

Q Rudy?

A Yeah.

Q Did the storage well integrity program also include putting a rig on each of the storage wells?

A That's the only way you could do it.

Q And running casing and inspection logs?

A Yes.

Q Anything else?

A Pressure test the casing.

1 Q You did say that, thank you.
2 Anything other than what you mentioned?
3 A Well, you know, I don't remember
4 exactly what. There's probably some other
5 things you do while you're doing it. Change
6 seals in the wellhead and run a cement
7 integrity log.
8 Q Did you make any of these
9 recommendations regarding a storage well
10 integrity program in writing?
11 A Yes.
12 Q To whom?
13 A To Rudy.
14 Q And what was the response that you
15 received, if any?
16 MR. GRAVELLE: From Rudy?
17 MR. GRUEN: Yeah, from Rudy.
18 THE WITNESS: Well, there was
19 discussion and, you know, there was I think
20 acceptance it was a good idea and it wasn't
21 exactly a new idea at that point. I think it
22 did eventually make its way into the, you
23 know, I think it was in SoCalGas' 2016 rate
24 case where they applied for it.
25 MR. GRUEN: Q Indeed. So when you say
26 that SoCalGas knew a storage well integrity
27 program was needed before they could collect
28 it in rates, is that because of your 2009

recommendation to Rudy?

A Repeat the question.

Q Sure. I'm reading the part of the e-mail that we just covered, the November 30th e-mail. Let me see if I can find it a second and point you back to it. Let's go off the record for just a second.

(Off the record.)

MR. GRUEN: Q Back on the record. So I'm referring to the first paragraph under Exhibit 4 at the end,

"In other words, they knew it was needed but haven't started it because they couldn't yet collect it in rates."

Do you see that?

A Yeah.

Q So that was referring to the storage well integrity program that you had recommended, wasn't it?

A It was a storage well integrity program. Whether it was the one I recommended, I can't say.

Q Okay. And to your knowledge was the storage well integrity program recommended by others in SoCalGas Company?

A I think there was pretty general acceptance it was a good idea.

1 Q And at what point in time was that?
2 A I don't know.
3 Q Prior to 2009?
4 A I think it was after that when it,
5 you know, we really started discussing
6 something like that.
7 Q If SoCalGas had started a storage
8 well integrity program in 2009 when you
9 recommended it to Rudy, what would have been
10 done differently in terms of -- well, let me
11 just ask. What, if anything, would have been
12 done differently for wells like SS-25?
13 A Well, my presumption of how it
14 would have worked is there would be a
15 schedule, there'd be an analysis of how
16 should we prioritize the wells to do the
17 inspections on and, you know, over some
18 period of years you'd have a schedule and do
19 so many wells per year.
20 Q And given its age, would Well
21 Access 25 have received a certain level of
22 prioritization compared to some of the other
23 wells or most of the other wells at Aliso?
24 MR. GRAVELLE: Objection, calls for
25 speculation.
26 MR. GRUEN: Q Based on your
27 recommendation, how would a well like SS-25
28 received prioritization?

A Well, first of all, the well integrity program would have applied to all the storage fields, not just Aliso, and I probably would have prioritized the wells closer to urban areas. For example, Playa del Rey would have been the first priority.

Q Simply by virtue of it being in an urban area?

A Right. So when you got to Aliso, yeah, age would have probably been a consideration in prioritizing wells.

Q All other things being equal, would you have prioritized a brand new well in Playa del Rey over an older well at Aliso?

A Not a brand new well, no, but --

Q A 10-year-old well versus a 70-year-old well?

A That's a debatable thing. I might have.

Q So there are more factors than --

A Than just age of the well, yeah.

Q -- just age and more factors than just whether it's in an urban area, too; is that fair?

A Yeah.

Q What other factors?

A Well, what's the history? I mean when you were doing that, you'd look at has

1 there been any previous casing inspection
2 logs on the well and what did those look
3 like, is there a reason, you know, to think
4 this well has a corrosion problem or
5 something.
6 Q Yes. What about leak history?
7 A That would certainly be a
8 consideration, yeah.
9 Q So you'd look at all of these
10 things together --
11 A Right.
12 Q -- to figure out how to
13 prioritize --
14 A Right.
15 Q -- the whole set of wells?
16 A Right.
17 Q What other factors, if any?
18 A I can't think of any other factors
19 right offhand, not to say there probably may
20 not be some other factors.
21 Q I'm not asking you to be
22 exhaustive, just to the best of your
23 recollection. That's helpful. Thank you.
24 Were these factors part of the
25 recommendation that you gave to Rudy in 2009?
26 A That recommendation did not get
27 into that depth, no.
28 Q Did you talk about these factors at

1 any other point in time when you were
2 discussing a storage well integrity program
3 with SoCalGas?
4 A Oh, I'm sure we did.
5 Q Following the 2009 recommendation?
6 A Yeah.
7 Q Prior to the 2016 General Rate
8 Case?
9 A Yeah.
10 Q Prior to the application of the
11 2016 General Rate Case?
12 A I would think so.
13 Q Okay. You see what I'm doing, I'm
14 trying to get a sense, and I know it's back
15 in time, but to the best of your
16 recollection, approximately when did you
17 start talking about the factors?
18 A Oh, I think, you know, from 2009
19 forward we were having discussions about it.]
20 Q Okay. All right. So you -- you
21 talked about the -- the 2016 general rate
22 case, and that's my understanding, too, as
23 well, that -- that there was a storage well
24 integrity program called the Storage
25 Integrity Management Program that was part of
26 that application, and we've seen workpapers
27 with regards to that.
28 To your knowledge, did SoCalGas --

1 in preparing for that application, did
2 SoCalGas have documentation supporting their
3 workpapers about the wells justifying the
4 storage well integrity program request?
5 A I don't think I had really any
6 involvement in preparation for that rate
7 case.
8 Q Okay.
9 A I think that was after I started
10 working, you know, one or two days a week.
11 Q Okay. That was toward the end of
12 your tenure there. I get that.
13 A Yeah.
14 Q Fair -- fair point.
15 And based on your experience,
16 who -- which people are the people who had
17 the most knowledge about the storage well
18 integrity program at Southern California Gas
19 Company towards or at your retirement?
20 A Well, it would have -- I think Phil
21 Baker was the witness in that rate case, and
22 it would have been the guy that replaced me,
23 whose name was Tom Schroeder.
24 Q Tom Schroeder. Yeah. Okay. Yeah.
25 Thank you. Let's go -- based upon your
26 experience working for SoCalGas, and other
27 sources of information you did talk about --
28 strike that. Strike that.

1 With regards to corrosion, you
2 mentioned there was no history of corrosion
3 for most of the wells on Aliso, I think, with
4 the --
5 A Yeah.
6 Q -- noted exceptions that you
7 pointed out.
8 And re- -- you mentioned, I think,
9 as well, that it was through pulling certain
10 of the casings that one could observe
11 corrosion? No?
12 A No. I think I said we rarely, if
13 ever, pulled casings.
14 Q I stand corrected.
15 A Maybe you abandon a well; but, like
16 I said, I had -- I don't remember ever doing
17 that at Aliso Canyon. It was through the
18 casing inspection logs.
19 Q Casing inspection logs. Thank you.
20 Thank you.
21 And is that -- was that the way to
22 track corrosion?
23 A Yes.
24 Q Okay. Any other way to track
25 corrosion?
26 A Well, you know, we did what you
27 could say is the equivalent of leaks, or we
28 ran temperature logs in every well once a

1 year.
2 Q Okay. What --
3 MR. GRAVELLE: I'm sorry. Did you
4 finish?
5 THE WITNESS: Yeah, I did.
6 MR. GRUEN: Q What role, if any, did
7 corrosion on wells play in your
8 recommendations regarding a storage well
9 integrity program?
10 A Well, as one possible source of --
11 of loss of integrity.
12 Q Okay. So it would be a factor in
13 terms of the prioritization of wells?
14 A Yeah.
15 Q Okay. How much weight did
16 corrosion of a well carry in terms of
17 recommendations for well integrity management
18 compared to other factors?
19 MR. GRAVELLE: I'm sorry. Are you
20 asking in general or his --
21 MR. GRUEN: No.
22 Q I'm really referencing to the --
23 the discussions following the 2009
24 recommendation to Rudy, where you talked
25 about the factors in the storage well
26 integrity program.
27 A I don't know how to answer that
28 question.

1 Q Okay. Did -- did you talk about
2 corrosion when you were at --
3 A Oh, I'm sure we did, yeah.
4 Q Okay. All right. Are there
5 e-mails or other writings that you had in
6 your capacity while you worked for Southern
7 California Gas Company re- -- related to the
8 creation or implementation of a storage well
9 integrity program?
10 MR. GRAVELLE: I'm sorry. I missed the
11 part about "in your possession." Can the
12 court reporter read that question back for
13 me?
14 MR. GRUEN: Let's go off the record.
15 (Off the record.)
16 (Record read.)
17 MR. GRAVELLE: Thank you.
18 MR. GRUEN: Okay. Yeah. Sure.
19 THE WITNESS: I would think there are,
20 but I don't have any of those.
21 MR. GRUEN: Q Yeah.
22 A I didn't -- you know, that would
23 have been on SoCalGas' system.
24 Q Okay. What -- I'm trying to get a
25 sense of what questions to ask to get
26 these -- access to those e-mails.
27 How would you couch a question --
28 how would you recommend that we couch a

1 question in order to get access to e-mails
2 about those -- those --
3 A Well, I would think questions about
4 well integrity program.
5 Q Just generally?
6 A (Nods.)
7 Q Probably mentioning your name, as
8 well?
9 A Well, yeah. I mean I would think,
10 from your perspective, any e-mails or memos
11 regarding well integrity would be of
12 interest.
13 Q Certainly, yes. Thank you. Okay.
14 Let's switch topics.
15 This is a document that we have not
16 yet circulated, so if -- if I can, this is a
17 document that has Bates stamps JM0027 and
18 JM0028. It says, on top, "From: Mansdorfer
19 To: Bob Nunn," N-u-n-n --
20 A Uh-huh.
21 Q -- dated Wednesday, November 25th,
22 2015, 10:36 a.m.
23 And if this could be marked
24 Exhibit 6.
25 (Exhibit No. SED-06 was marked for identification.)
26
27 MR. GRUEN: Q And here, on JM0028, it
28 looks like you wrote to Mr. Nunn.

1 A It looks like he e-mailed me first.
2 Q He -- indeed, it does, yes. And
3 I -- I jumped ahead. But, you're right; so
4 we'll start at that point. Fair enough.
5 Where he asks, "Why aren't they
6 putting a cement plug and simply abandoning
7 the well," and I think that -- that's really
8 the sentence that prompted the -- the
9 thread --
10 A Yeah.
11 Q -- if I'm tracking that correctly.
12 A Uh-huh.
13 Q Okay. And you write back, "Bob,
14 I'm not privy to details, but I'm guessing
15 the reason for not pumping cement into the --
16 into the well --" I assume it's the well?
17 A Yeah. Right.
18 Q "Is that it would not shut off
19 gas -- it would not shut off flow of gas but
20 would block ability to pump into the well."
21 A Uh-huh.
22 Q "Pumping into well has increased
23 flow of gas to surface and that is apparently
24 why they have been cautious about pumping
25 into well. It would seem to me that pumping
26 the heaviest clay based drilling mud down the
27 tubing at maximum possible rate should kill
28 the well. As far as I know they have been

1 afraid to try this."
2 And then, turning on to -- back to
3 the -- the beginning of the thread that we
4 have, JM0027, we see from Mansdorfer to Bob
5 Nunn that the response appears to be "Yes,
6 gross mismanagement. After a week of not
7 being able to control the well they should
8 have put wells around it on withdrawal to
9 reduce reservoir pressure and should have
10 started relief well. Nearly 5 weeks and
11 drilling of relief well still not started."
12 Does that ac- -- accurately capture
13 the e-mail thread, what I just read?
14 A Well, you missed the response from
15 Bob on 028, where it says, "Sounds like it.
16 Really managing it poorly. Bob."
17 Q Ah, so I did. Thank you for the --
18 the correction. That was an oversight on my
19 part. Indeed. Okay.
20 And that -- that accurately -- with
21 added correction --
22 A Yes.
23 Q -- that accurately captures the
24 thread?
25 A Yes.
26 Q Okay. Thank you. So when you
27 joined the technical advisory group, did you
28 talk about -- I -- I get that you didn't talk

about the relief well. You were told not to talk about that.

A Uh-huh.

Q You said that earlier.

But, after a week of not being able to control the well, they should have put wells around it on withdrawal to reduce reservoir pressure, did you talk about that part with the technical team?

A Well, that was one of the first things that I did when I got up there, was worked with the people there to -- they -- they'd already started doing that. But, yeah, I worked with them to get as many wells around the blowout well on withdrawal.

Q Uh-huh. So -- so had the group -- the technical advisory group done -- started work on getting wells around on withdrawal -- around SS-25 on withdrawal before you got there?

A I think they had just started that, yes.

Q Do you know at what point, approximately, they had started?

A No.

Q Okay. Did the withdrawal effort change when you arrived?

A Well, I -- yeah. We -- I worked --

1 there was problems with a number of the wells
2 where they had been taken out of service for
3 whatever reason. So one of the things I
4 focused on initially was doing what we could
5 to get the surrounding wells on withdrawal.
6 Q So -- so did the with -- the amount
7 of gas withdrawn from the surrounding wells
8 increase once you arrived?
9 A I believe it did.
10 Q And why is that?
11 A Well, like I said, because I worked
12 with people there to try to resolve some of
13 the issues that had prevented those wells
14 from being put on withdrawal.
15 Q Okay. You also add here, at the
16 beginning, "Yes, gross mismanagement."
17 A Yeah.
18 Q What did you mean by that?
19 A Well, I just saw it -- I mean I --
20 several things that -- things that I
21 mentioned here, you know, the things we
22 talked about earlier about why didn't they
23 pump the heaviest clay-based drilling mud
24 into the well they could have, all of those
25 kind of things.
26 Q And after joining the technical
27 advisory group, what -- how did that opinion
28 change, if at all?

A Well, I -- I don't think it changed too much.

Q Why -- why is that? Let me just be clear. I'm asking about the gross management opinion.

A Right.

Q So you're saying that you didn't think that it changed too much.

A Well, the mismanagement of it in the beginning, I don't think that opinion changed much.

Q Okay. Even after you joined the technical advisory group?

A Well, that opinion was for the period before I joined.

Q I understand.

A I mean in the beginning.

Q Okay. What was your opinion of -- with regards to gross mismanagement after you joined the technical advisory group?

A I don't think I would characterize it as gross mismanagement. I think they had more expertise at that point.

Q Okay. Would you -- would you -- do you think there was mismanagement?

MR. GRAVELLE: At what point?

MR. GRUEN: At the point in which he joined the technical advisory group.

1 MR. GRAVELLE: Moving forward, you
2 mean?
3 MR. GRUEN: Correct. Yes. That's a
4 good clarification. Thank you.
5 THE WITNESS: I don't know if
6 mismanagement's the right word. I --
7 there's -- if I'd have been in full control,
8 I would have done some things different than
9 were done. But, I don't know that I would
10 classify it as mismanagement.
11 MR. GRUEN: Q What would you have done
12 differently?
13 A Well, I would have been prepared to
14 pump at a higher rate on the final kill
15 attempt.
16 Q On the final kill attempt?
17 A Yeah.
18 Q After you joined?
19 A Right.
20 Q Did you -- and you proposed pumping
21 at a higher rate when you arrived?
22 A Yeah.
23 Q To the technical advisory group?
24 A (Nods.)
25 Q Correct?
26 A Yeah.
27 Q Yeah. And what response did you
28 receive when you proposed that?

A Well, they're -- you know, the -- Albert and Boots & Coots guys did calculations on what we could pump at, the maximum rate, without exceeding the pressure limits, and it was wrong, and when we pumped, we were on a vacuum. We could have pumped at a higher rate, but they weren't set up to do it. So --]

Q And how do you know it was wrong, their calculation for the pump?

A Well, because the well went on a vacuum. We didn't get to the pressure limit.

Q That's in hindsight; right?

A Yeah.

Q So did you know at the time that the calculation was wrong?

A No.

Q Did you have any idea that it was wrong?

A No.

Q Okay. Subsurface safety valves very quickly. What is your understanding as to whether subsurface safety valves, can they work for both tubing and casing of a well or merely tubing?

A Well, there's different styles. PG&E has ones that work on both tubing and casing. I think they're kind of troublesome

1 but most of them, well, almost all of them
2 are set up to work on tubing only.
3 Q I see. And that includes for
4 deepset?
5 A Right. It would have to flow
6 through a packer and to the tubing. And then
7 if you wanted to flow in the annulus, it
8 would have to flow out through ports and up
9 the annulus.
10 MR. GRUEN: Okay, do you have any quick
11 questions?
12 MR. HOLTER: Yes, couple quick ones.
13 MR. GRUEN: We've got about one minute.
14 MR. HOLTER: Just a clarification.
15 EXAMINATION (RESUMED)
16 BY MR. HOLTER:
17 Q Can you explain when you said,
18 they, who they were, weren't set up for it.
19 Can you explain that again quick.
20 MR. GRUEN: Why don't we -- I think
21 he's not going to have the context. Let's go
22 off the record for a moment.
23 (Off the record.)
24 MR. GRUEN: Back on the record. You
25 want to ask it again.
26 MR. HOLTER: Okay, agreeable.
27 Q Would you please be more specific
28 on referring to your statement about the well

1 went on vacuum, what that means, and then the
2 statement "they weren't set up for it."
3 Could you explain that a little more, please.
4 A Right. Well, Halliburton was there
5 doing the pressure pumping and they weren't,
6 Halliburton, wasn't set up to pump at a
7 higher rate.
8 Q Does that mean they didn't have the
9 equipment for it or they didn't have the
10 methodology and calculations, which one?
11 A It was -- well, I don't think they
12 knew it would be an issue. But, yeah, the
13 heavy mud wouldn't flow out of the tanks into
14 their pump truck at a high enough rate to
15 go -- it went at the rate they had planned on
16 going, but when we saw we didn't reach the
17 pressure limit, we couldn't have gone to a
18 higher rate because the mud wouldn't flow
19 from the tanks into the pumps.
20 Q And was that vacuum in the well?
21 A Yeah.
22 Q And what was happening in the well
23 when you say "vacuum"?
24 A Well, the heavy mud went down the
25 tubing and the weight of it caused it to go
26 on a vacuum.
27 Q Does that mean it's actually
28 pulling faster than they can pump?

1 A Yes.
2 Q Thank you. I appreciate the
3 clarification.
4 A Okay.
5 MR. GRUEN: Mr. Mansdorfer, thank you
6 very much for your time. You were required
7 to be here but we still appreciate your
8 efforts to answer questions throughout the
9 day and we know it's been a long session. We
10 appreciate you being here.
11 MR. GRAVELLE: Before we go off the
12 record, may I have two minutes with him?
13 MR. GRUEN: Certainly, and we can
14 discuss --
15 MR. GRAVELLE: Can we go off the
16 record?
17 MR. GRUEN: Yes, off the record.
18 (Off the record.)
19 MR. GRUEN: Mr. Gravelle, did you have
20 a clarification question for Mr. Mansdorfer
21 with respect to the subsurface safety valves?
22 MR. GRAVELLE: Yes. Thank you. There
23 was some prior testimony by Mr. Mansdorfer.
24 I'll paraphrase it. I think he wants to
25 clarify his record and give you an
26 opportunity to explore that clarification.
27 MR. GRUEN: Okay.
28 MR. GRAVELLE: My notes indicate that

1 he had testified to the effect that there was
2 a good chance that subsurface safety valves
3 would have worked to prevent the leak but
4 that there was some speculation on that
5 point. That's the general gist of his
6 testimony.
7 MR. GRUEN: Okay.
8 MR. GRAVELLE: And I want to go back.
9 CROSS-EXAMINATION
10 BY MR. GRAVELLE:
11 Q When you said "good chance," do you
12 think the phrase "good chance" is the best
13 characterization or would you care to
14 rephrase that characterization?
15 A I would, yeah. Good chance is -- I
16 don't know even for sure what I meant by
17 that. There's a possible chance it would
18 have. But, again, I didn't have any direct
19 experience with those deepset subsurface
20 safety valves other than the one at Goleta,
21 which actually failed.
22 So I think I may have been
23 speculating too much that it would have
24 prevented the leak when I don't have a good
25 basis for actually saying that.
26 MR. GRUEN: Okay. So your statement
27 has changed to say that there's a possible
28 chance that a subsurface safety valve on

1 SS-25 would have prevented the incident from
2 happening?
3 THE WITNESS: That's correct.
4 MR. GRUEN: Okay, fair enough. No
5 further questions.
6 MR. GRAVELLE: All right.
7 MR. GRUEN: Thank you.
8 MR. GRAVELLE: Would you care to
9 propose a stipulation?
10 MR. GRUEN: Yeah, I think so.
11 MR. GRAVELLE: And interpose your
12 objections.
13 MR. GRUEN: Yeah, indeed, and we can
14 clarify, both interpose the objections or
15 concerns if --
16 MR. GRAVELLE: Right, right.
17 MR. GRUEN: -- we see fit that we
18 discussed off the record. I think that's a
19 good suggestion, Mr. Gravelle.
20 So just with regards to
21 confidentiality, so consistent with other
22 examinations under oath, the Safety and
23 Enforcement Division will keep the
24 transcripts confidential, as is its
25 prerogative.
26 If SED chooses to make the
27 transcripts not confidential at a later date,
28 that is SED's prerogative. But at this time

1 it is SED's intent to keep the transcripts
2 confidential.
3 With regards to Mr. Mansdorfer
4 sharing his recollections of the examination
5 under oath today, SED is noting for the
6 record its objection to doing so. That is an
7 order to be consistent with SED's position
8 that the examinations under oath, that it has
9 done to date are to be kept confidential.
10 So with that, is there anything that
11 you want to add or is there anything you want
12 to do to address that?
13 MR. GRAVELLE: Maybe we should start
14 where I think you and I agree, which is it's
15 my understanding, you can tell me if you
16 disagree.
17 MR. GRUEN: Go ahead.
18 MR. GRAVELLE: It's my understanding
19 that when the court reporters' transcript is
20 prepared, you'll send me an e-mail advising
21 me of the same and that it will be made
22 available in the CPUC's Los Angeles office
23 for up to 30 days upon my receipt of the
24 e-mail for either Mr. Mansdorfer or myself or
25 both to review it provided, however, that if
26 any changes or corrections Mr. Mansdorfer
27 wishes to make, which are voluntary, not
28 mandated, he will make them.

1 That is, for example, I may come in
2 and review them in your office but I would
3 not have the authority to actually make any
4 changes. Only he would within that time
5 period. I think on that issue are we in
6 agreement?
7 MR. GRUEN: Yeah, largely. Just as a
8 clarification, I don't think this changes
9 really the substance of the agreement. It
10 may take a little bit of time between when we
11 get the transcripts electronically and when
12 they're actually made available in hard copy
13 for review.
14 Once we have them in hard copy, we
15 will let you know and you can come in and
16 review them. Mr. Mansdorfer, if you wish for
17 Mr. Gravelle to do that in your stead --
18 THE WITNESS: I do, yes.
19 MR. GRUEN: -- that's fine. And then,
20 Mr. Gravelle, if you see anything that needs
21 to be changed and at that point you wish to
22 come in and suggest the changes to us, we can
23 arrange for that as well. That's fine.
24 MR. GRAVELLE: In other words, you'll
25 send me -- we'll have 30 days after I receive
26 the e-mail, but it may take some time from
27 when you get the transcript for you to send
28 me the e-mail.

1 MR. GRUEN: Correct.
2 MR. GRAVELLE: And that's fine.
3 MR. GRUEN: Yeah, that's exactly right
4 so that's fine.
5 MR. GRAVELLE: And then putting aside
6 the actual transcript but in terms of what
7 was asked, what was answered, impressions,
8 context, all of that, as you know, we've
9 discussed off the record we have a much
10 different view being that he was under no
11 obligation to keep it confidential coming in
12 and he should not have any confidentiality
13 obligations to that when he leaves.
14 Hence, we object to any attempts to
15 interpose confidentiality obligations and we
16 do not intend to abide by any requests by the
17 CPUC to keep it confidential. So if the CPUC
18 wants it kept confidential in terms of
19 questions, answers, context, they will need
20 to seek a court order because we intend to --
21 I'm not saying we're going to go out today
22 and obviously start broadcasting it -- but we
23 do not intend to abide by any restriction on
24 that.
25 I just want to give you fair game
26 and warning, but I do understand that you
27 view it differently.
28 MR. GRUEN: Yeah. And related to that,

1 for the record, we prefer that Mr. Mansdorfer
2 not share what his recollections of what were
3 discussed today, he understands that, but we
4 understand the objection.
5 MR. GRAVELLE: Okay. I think are we --
6 MR. GRUEN: With that, let's go off the
7 record.
8 MR. GRAVELLE: Yeah, we're off the
9 record.
10 (Off the record.)
11 (Whereupon, at the hour of 4:20
p.m., the examination under oath was
12 concluded.)]
13 * * * * *
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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Andrea L. Ross, Certified Shorthand Reporter No. 7896, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on September 13, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 13th day of September, 2018.

Andrea L. Ross
CSR No. 7896

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Rebekah L. De Rosa, Certified Shorthand Reporter No. 8708, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on September 13, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 13th day of September, 2018.

Rebekah L. De Rosa

Rebekah L. De Rosa
CSR No. 8708

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Investigation	)	I.19-06-016
on the Commission's Own Motion	)	(Filed 6-27-19)
into the Operations and Practices	)	
of Southern California Gas Company	)	
with Respect to the Aliso Canyon	)	
Storage Facility and the release	)	
of natural gas, and Order to Show	)	
Cause Why Southern California Gas	)	
Company Should Not Be Sanctioned	)	
for Allowing the Uncontrolled	)	
Release of Natural Gas from Its	)	
Aliso Canyon Storage Facility.	)	
(U904G).	)	
_____	)	

DEPOSITION OF MARGARET C. FELTS
Los Angeles, California
Wednesday, February 5, 2020
MORNING SESSION

Reported by:
LINDA RYAN
CSR No. 9915
JOB No. 311652

1 BEFORE THE PUBLIC UTILITIES COMMISSION
2 OF THE STATE OF CALIFORNIA
3
4 Order Instituting Investigation) I.19-06-016
on the Commission's Own Motion) (Filed 6-27-19)
5 into the Operations and Practices)
of Southern California Gas Company)
6 with Respect to the Aliso Canyon)
Storage Facility and the release)
7 of natural gas, and Order to Show)
Cause Why Southern California Gas)
8 Company Should Not Be Sanctioned)
for Allowing the Uncontrolled)
9 Release of Natural Gas from Its)
Aliso Canyon Storage Facility.)
10 (U904G).)
_____)
11
12
13
14 Videotaped Deposition of
15 MARGARET C. FELTS, pages 1 through
16 326, taken in accordance with
17 Article 10 of the Commission's Rules
18 of Practice and Procedure, taken on
19 behalf of the Southern California Gas
20 Company, at 300 South Grand Avenue,
21 Twenty-Second Floor, Los Angeles,
22 California, beginning at 9:23 a.m. and
23 ending at 8:39 p.m. on Wednesday,
24 February 5, 2020, before LINDA RYAN,
25 Certified Shorthand Reporter No. 9915.

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HEIDI FIELDING, Videographer

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Los Angeles, California
Wednesday, February 5, 2020
9:23 a.m. - 12:15 p.m.

PLEASE BE ADVISED THAT THE DISMANTLING AND/OR UNBINDING OF THE ORIGINAL TRANSCRIPT WILL VOID THE CERTIFICATION OF THE CERTIFIED SHORTHAND REPORTER AND NULLIFY THE INTEGRITY OF THE ORIGINAL TRANSCRIPT.

THE VIDEOGRAPHER: Good morning.

Here begins media number one in the deposition of Margaret C. Felts, Volume 1, in the matter of Aliso Canyon Storage Facility. This case is before the Public Utilities Commission of the State of California, the case number is 1.19-06-016.

Today's date is February the 5th of the year 2020 and the time on the video monitor is 9:23 a.m.

This deposition is taking place at 300 South Grand Avenue, 22nd floor, in Los Angeles, California 90071-3132, and is being taken on behalf of the Defendants.

The videographer is Heidi Fielding, appearing on behalf of Biehl, et al., Certified Shorthand Reporters.

The certified stenographic reporter preparing the official transcript of today's deposition is Linda Ryan, appearing on behalf of Biehl, et al., Certified Shorthand Reporters.

Neither the reporter nor myself are employees of Biehl, et al., Certified Shorthand Reporters.

Counsel, would you please identify yourselves and state whom you represent.

MR. STODDARD: Jack Stoddard for Southern California Gas.

MR. MOSHFEGH: Pejman Moshfegh also for Southern California Gas.

MS. PATEL: Avisha Patel on behalf of Southern California Gas.

MS. MORTAZAVI: Setareh Mortazavi on behalf of Southern California Gas Company.

MR. GRUEN: Darryl Gruen on behalf of the Safety Enforcement Division of the California Public Utilities Commission.

THE VIDEOGRAPHER: And if our court reporter would please administer the oath to the witness.

(Witness sworn.)

THE WITNESS: I do.

THE VIDEOGRAPHER: Please begin.

MR. STODDARD: Thank you.

MARGARET C. FELTS,
having been first duly sworn
and administered an oath
pursuant to California CCP 2094,
was examined and testified as follows:

EXAMINATION

BY MR. STODDARD

Q Would you please state your name and your home address.

A Margaret C. Felts. And I live at 633 Dodge Street, Delta, Colorado 81416.

Q Thank you, Ms. Felts.

And is this the first time you've ever been deposed?

A No.

Q How many times have you been deposed before?

MR. STODDARD: One moment, brief break.

THE VIDEOGRAPHER: Do you wish to go off the record, Counsel?

(Whereupon Ms. Shea entered the deposition proceedings.)

MR. STODDARD: Yes, please.

THE VIDEOGRAPHER: Just a moment.

We are off the record at 9:26 a.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record at 9:26 a.m.

MR. STODDARD: Ms. Felts, apologies.

Before we get into the questioning, we're going to address a few initial housekeeping items for purposes of the record.

The first is that we had had prior discussions regarding reimbursement or compensation for Ms. Felts' appearance today.

SoCalGas agrees to pay for -- pay Ms. Felts directly for her time in appearing in today's deposition and -- with the understanding that SED will pay for her travel time as well as travel expenses.

MR. GRUEN: Thank you.

And just for the record, SED notes SED does not stipulate to paying for Ms. Felts' travel expenses or other expenses related to the deposition today, and SED reserves the right to request an ALJ ruling requiring Southern California Gas to pay for those expenses; so that's for the record.

A couple of other items.

SED will be requesting copies of the videotape of today's deposition of Ms. Felts as well as the transcripts of the deposition.

And just for the record, we'll note objections as we see appropriate if we -- if we think they're appropriate.

But for the record, we -- I'm in receipt of, for Ms. Felts, a copy of her testimony in Southern California Gas Company's and San Diego Gas & Electric Company's Application 1509013, which is her testimony for UCAN, a party that counsel is not present today.

And our understanding is that any questions related to that testimony is for the sole and exclusive purpose of the noticed deposition on the Aliso Canyon Order Instituting Investigation and Order to Show Cause, and that anything that Ms. Felts says today should not -- it's not appropriate to use anything she says related to that testimony in a 1509013 in that proceeding; so we'll note objections accordingly, but we wanted to make that clear for the record at the outset.

MR. STODDARD: Noted.

And SoCalGas's response on that is that SoCalGas doesn't waive any right to ask a question about any document or issue within Ms. Felts' scope

of knowledge or area of expertise or prior testimony or any other document; however, we note your objection regarding the use of that transcript for purposes of the PSRP proceeding.

MR. GRUEN: Your point is noted as well.

Thank you.

BY MR. STODDARD:

Q Okay. Ms. Felts, thank you. I believe we had just gotten through your name and home address.

And I had asked whether you had been deposed before and you indicated that you had been. And then I had asked how many approximate depositions had you submitted to, and I don't believe I had an answer to that question. But if I did, I apologize.

A And I don't have a number, but it's less than ten.

Q Less than ten. Okay.

And do you have an approximate number of those where you would have been an expert witness for purposes of the deposition?

A All of them.

Q Okay. So this isn't new to you, so I'm going to, you know, recount a few kind of rules of the road for the deposition. They will all be familiar to you I'm sure.

But first and most importantly, please speak clearly and slowly, and I will try to do so as well. Please respond verbally to any questions.

The court reporter can't capture nods or gestures; so make sure that you answer with words, "yes," "no," or otherwise.

The court reporter can't capture what we're saying if we're interrupting each other and talking over each other; so please don't interrupt me, and I will try not to interrupt you.

Wait until the question is asked before you answer it, and I will wait until you finish your answer if I can before I ask my next question.

Also, in general, your attorney may state objections for the record. But you should still answer the question unless you're specifically directed by your attorney not to answer the question.

And finally, in terms of breaks, we're going to plan on taking a break, you know, probably approximately at least every hour, but if you need a break at any time, just say so. But please answer any question that was asked prior to taking a break.

A Okay.

Q And Ms. Felts, are you represented here by counsel today?

A Yes.
Q And who is your counsel?
A Darryl Gruen.
Q Thank you.
And is Mr. Gruen representing you in your personal capacity?
MR. GRUEN: I'm sorry, just to -- maybe to clarify for the record.
Is the question whether --
Just to clarify maybe you could ask is -- whether she is being represented as a witness for SED or personally.
BY MR. STODDARD:
Q Ms. Felts, today here you are appearing as a witness for SED; is that correct?
A Yes.
Q And so Mr. Gruen is representing SED and you as a witness for SED, correct?
A Yes.
MR. STODDARD: Thank you.
I'd like to mark Exhibit 1-1.
(Deposition Exhibit 1-1 was marked for identification and is attached hereto.)
BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?
A Yes.
Q This is a deposition notice asking for your appearance here today; is that correct?
A Yes.
Q If you can turn to page 3 of the document.
Do you see where it asks for documents to be produced?
A Yes.
Q And the first request is for "All work papers not previously produced to SoCalGas that Margaret Felts generated or relied upon in connection with the above captioned matter."
A Yes.
Q Do you see that?
Did you collect documents in response to that request?
A Everything was already provided to you.
Q Okay. So would it be accurate to say that we have -- that all work papers that would be responsive to this request have been collected and provided to SoCalGas prior to today's deposition?
MR. GRUEN: Let me just note an objection for the record, and I think we had agreed to this, that the definition of "work papers" excludes anything

that would be used for future testimony, such as the reply or the rebuttal testimony. And we understand the definition to be qualified in such a way that it's only applying to the testimony that Ms. Felts has produced in this proceeding thus far.

MR. STODDARD: Objection noted.

I'm going to restate the question and ask that Ms. Felts answer it.

Q I'll break it into two different questions though.

First, all work papers that were generated prior to service of your opening testimony or SED's opening testimony in this proceeding, were those collected and produced to SoCalGas prior to today's deposition?

A Yes.

Q Okay. And have you generated additional work papers since then, since service of your opening testimony that were not produced for purposes of today's deposition?

MR. GRUEN: Again, I'm just going to object on the grounds that those questions -- questions related to work papers since the production of testimony are protected on the grounds of attorney-client or -- and/or work product privilege; so I'm going to

instruct the witness not to answer the question, the second question.

BY MR. STODDARD:

Q Okay. Ms. Felts, question number 2 requests all written testimony or reports that you prepared related to underground storage facilities, correct?

A Yes.

Q And did you collect and produce any written testimony or reports as requested by that item?

A I looked for testimony in the Montebello Storage Unit case, but I don't have that file anymore; so I don't have it. I think I produced testimony at the time. I don't have a copy of it.

I also have some documents related to the Playa del Rey case that I worked on. I don't believe a final testimony was ever published in that case. I think it was settled.

MR. STODDARD: Thank you very much.

All right. I would like to mark Exhibit 1-2.

(Deposition Exhibit 1-2 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

SED SUR_REPLY_000839

A Yes.
Q And this is your resume, correct?
A Yes.
Q This is the resume that you produced to SoCalGas and which you included with your -- with their testimony; is that correct?
A Yes.
Q I'd like to ask you a few questions about this.
First -- the first sentence of this document states that you serve as lead technical consultant to law firms, regulatory agencies and private entities on environmental, energy and corporate fraud cases concentrating on behind-the-scene discovery, research and strategy development.
Do you see that?
A Yes.
Q Are there any current matters aside from the one that we're here for today that you're working on?
A Yes.
Q Are you able to tell us about those matters?
MR. GRUEN: Just note an objection to the extent that they're unrelated and irrelevant to the proceeding at hand, Aliso -- to the Aliso Order Instituting Investigation and Order to Show Cause.

But she can go ahead and answer.

MR. STODDARD: Yeah.

We don't know whether they're relevant or not unless we know what they are.

MR. GRUEN: Understood.

THE WITNESS: There are two cases that are open:

One has to do with a leaking gasoline pipeline owned by an oil company in the east, in Pennsylvania, it's a private matter; so that's about as much as I can tell you.

BY MR. STODDARD:

Q You said a gasoline pipeline?

A Yes.

Q Like automotive fuel?

A Yes.

Q Okay. And you said that's in the east; is that correct?

A It's in Pennsylvania.

Q And that's a private matter between two corporate entities?

A It's between a land owner and the oil company.

Q And which party are you working for in that case?

A The private --

The plaintiff.

Q Okay. And are you a consulting expert in that case or testifying expert?

A Both.

Q "Both." Okay.

And you said there was another case?

A A small property issue in Northern California having to do with, again, a private land owner and PG&E. I'm representing --

I'm the expert for the plaintiff, the land owner.

Q Okay. And does that relate to PG&E electrical facilities?

A No, it's PG&E gas.

Q It's related to PG&E Gas. Okay.

Does it involve a gas storage facility?

A No. Pipeline.

Q Okay. Ms. Felts, I'm going to direct you down to the next section where it says "Specialties." And it says "Discovery and technical strategies for complexion cases involving," and then it lists a variety of subject matter areas.

Do you see that?

A Yes.

Q What sorts of discovery and technical

strategies do you specialize in?

A I write discovery questions, and I help with developing a strategy based on data that has been collected or been provided. I also do research to supplement that with additional information.

Q What sort of research?

A Technical research or flush out the issues of a case, help attorneys understand technical issues.

Q Thank you.

Under the next bullet which states "Gas and Electric Utilities regulatory cases," it states "Records Management Assessment" under the first sub bullet there.

Do you see that?

A Yes.

Q What exactly is "Records Management Assessment"?

A To do a records review to see if the recordkeeping practices are in keeping with standard or what would be expected in the industry that the case is working in.

Q Thank you.

The next bullet down -- or two, I'm sorry, skip it, says "Fraud" and then "Incident Assessment."

A Yes.
Q What do you mean by "Incident Assessment"?
A So if there was a spill, say I would do an assessment of the records and the data that resulted from that or transcripts or whatever is -- whatever records are available, and assess the situation from the beginning to the end and probably develop a report to whoever I was working for, usually an attorney.
Q Okay. So in the context of incident assessments it would be fair to say that your review or investigation is based on examination and collection and review of records and documents?
A Yes.
Q And that you would prepare a report or testimony in those cases?
A Usually at that level an incident assessment in my mind would occur very early on. When somebody contacts me, I look at what they have.
Maybe look at news media or reports or whatever I can -- information is available and then do a short report or -- like an interim report to the attorney that gives them an idea of what I think -- what I think the incident information provides and what -- where the case might go on a technical level,

not on a legal level.

Q All right. Underneath that bullet you see where it says "Pipeline Integrity Assessment"?

A Yes.

Q Can you explain, please, what do you mean by that in this context?

A Well, again, so we're looking at records that have to do with a pipeline and whether or not the condition of the pipeline was sound or if there was an issue with the pipeline that can be identified early on as part of the case.

Q Based on the records?

A Yes.

Q Okay. And for "Underground Gas Storage Assessment"?

A Similar. Similar to the pipeline assessment, you just --

It's based on record reviews.

Q And what are you assessing relative to underground gas storage in that case?

A Well, it would depend on what the issue is because they seem to vary quite a bit. But it would be usually some sort of a gas leak from the storage unit. Sometimes a combined environmental issue that, you know, evolves from a complaint from a neighbor or

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neighborhood or somebody that lives near an underground storage area.

Q Okay. Does it include assessment of gas storage wells?

A Yes.

Q Okay. And in all of these instances, you have four different, or I guess five different items here are described as assessments, "Records Management Assessment, Incident Assessment, Tree and Pole Program Assessment, Pipeline Integrity Assessment," and "Underground Storage Assessment."

For each of these, these are based upon your review of records?

A Yes.

Q So not direct examination of physical evidence?

A In the tree and pole program assessment, I actually went out and did physical inspections in some instances.

Q Okay. On any of these assessments, do you interview people or witnesses?

A Not without an attorney present with me.

Q Okay. The next bullet down below that bullet is "Oil & Gas Industry Cases."

Are these generally similar to what we've

covered in underground gas storage assessment and pipeline assessment, or is this a different category of cases in your view?

A This is a category that I have not worked in for quite some time; I would say for at least 15 years. Where previously I was doing work in oil price projections, oil price setting or oil and refinery product price setting. There was -- there were quite a few different types of issues that were coming up that I was hired to review or help on. I haven't done that for a long time.

Q By "price setting," do you mean price fixing?

A Yes.

Q Okay. And this related to --

Were these regulated oil and gas companies? Or I guess let me restate that. I'm sorry.

Does this involve public utilities?

A No.

Q The next bullet down is "Natural Gas Supply and Demand Assessment."

Do you see that?

A Yes.

Q Can you describe what this work entailed?

A Again, this is an area that I haven't really

worked that much in recently, but in the 1980s and '90s, I worked quite a bit on that, and it had to do with assessing the available supply of natural gas and forecasting the supply and demand curves.

Q And was this related to supply of natural gas regionally?

A It was supply of natural gas within the United States, and it would have included Mexico.

Q Okay. So this was kind of a broad market analysis?

A Yes, because your pipeline is connected. I mean, the supplies cross borders; so it can't be just California. It would have to be nationally and in some instances international.

Q Because the natural gas pipeline system is integrated?

A Yes.

Q Kind of almost at the continental level?

A Yes.

Q And so a significant natural gas resource or piece of infrastructure is impacted by even relatively far flung demand across the country; is that correct?

A Well, I don't know if you have far flung demand. And the demand curves turn out to be fairly

consistent from one year to the next.

But there was a period of time when there were some entities who believed that either natural gas demand was going to go way up or way down, and so there would be a call for some sort of a forecast. And this is early -- probably before the year, I want to say 2000, because sometime around 2000, 2004 the Energy Information Administration stepped in and started providing some pretty good sound information, data, and forecasts that people could access easily. And it was easier for me to give people a link to that than to try to generate my own forecasts; so that demand for that work diminished.

Q The next bullet down is "Groundwater Contamination."

Can you please explain the work that you've done in that area?

A In the 1990s -- approximately 1990 to about 2000, I had an environmental company with employees, and we did environmental assessments and investigations, mostly having to do with groundwater.

And then year -- some time around 1998 to about 2002 I did a research project for Lloyds of London. And the basic question was who knew what, when about groundwater contamination in California

primarily, but it ended up extending throughout the United States.

And that review, I researched records back to I think it was 1895 and forward and developed a huge database about groundwater contamination.

Q So was the work that you were doing on groundwater contamination records-based work or was it field work?

A It was --

So the work that I did as a consultant was field work. We actually drilled and constructed groundwater monitoring systems. The research for Lloyds of London was records-based.

Q Okay. And was the groundwater contamination work you did particular to energy?

A No.

Q Okay. The next item you have on the list is "Hazardous waste disposal and site cleanup," with sub bullets for "CERCLA, RCRA" and "Underground Storage Tanks."

Do you see that?

A Yes.

Q What types of underground storage tanks did this concern?

A Gasoline, diesel, and anything else that was

in a tank below the ground.

Q Okay. This does not relate to natural gas storage fields, however --

A No.

Q -- correct? Okay.

All right. Moving over to your employment history. The first item that you identify is "Litigation Consultant 1983 - Present."

Do you see that?

A Yes.

Q I would note that that period of time overlaps with a number of other positions listed on your employment history.

A Yes.

Q Did you work both as a litigation consultant at the same time that you were employed by others?

A Yes. During that period of time there was only a -- there was a period of about five years when I worked for the California Communications Association when I was not working any active litigation cases. I had a couple that were sort of in remission that came alive later, but I wasn't working on them during that five years.

Q Was there any particular reason why you didn't take on cases during that period of time?

A Well, no particular reason. I think I was just busy doing work with the telephone companies and the association.

Q Okay. The next item down the list --

So we just discussed the California Communications Association.

From 1995 to 1997 you were a senior consultant for Dames & Moore; is that correct?

A Yes.

Q And what was your role there?

A I was just an engineer. I ran an engineering group in Northern California. We worked cases -- I worked cases in Washington state and Northern California. My team worked other cases in mostly Northern California, some in San Francisco, Bay area cases.

Q What sorts of engineering?

A Well, some were -- some of it was environmental engineering. There was air emission cases. There was groundwater cases.

Q Okay.

A There were permits that were being applied for having to do with complicated construction.

Q Okay. The next item down says --

MR. GRUEN: I'm sorry, I just want to clarify.

Are you finished answering that question?
THE WITNESS: Yes.
MR. GRUEN: Okay.
BY MR. STODDARD:
Q The next item down shows that from 1993 to 1995 you were the Deputy Director at the California Department of Toxic Substances Control; is that correct?
A Yes.
Q Can you describe your work there during that time period?
A I was in charge of the statewide site mitigation program; so we handled oversight of Superfund sites, state equivalent of Superfund sites. So those would be all funded and handled with -- by my team.
And then we had oversight over all of the hazardous waste site mitigation or cleanup, investigation and cleanups by private parties that were over -- you know, overseen by the state. And then I had an emergency management -- or emergency response group that handled response to emergencies that involved hazardous waste.
For instance, if a storm came in and washed a bunch of propane tanks down a river, we would go

out and deal with the problem. It was on-site work. And we also handled all of the drug lab cleanups.

Let me think.

We had a geologic group that did geologic assessments for site -- contaminated sites.

Q Did any of that work, as you recall, relate to natural gas facilities or natural gas?

A So if there was a complaint that came in for exposure to natural gas, we would have a team respond to it.

But typically anything having to do with a natural gas storage would be deferred to the lead agency, which would probably be the Public Utilities Commission or the Division of Oil and Gas. But we might join a team for an assessment on a site.

Q Do you recall any specific such cases?

A No, not offhand.

Q Your tenure there was fairly short, for two years.

Was there any particular reason that you left after two years?

A It was a political appointment.

Q Similarly your tenure at Dames & Moore was from 1995 to 1997.

Was there any particular reason that you

left that position after two years?

A They offered me a job, and I was in transition back from a political appointment to a consulting firm, and they agreed that I could sort of ride on their coattails while I made that transition; so I went to Dames & Moore. I pulled my old clients and worked to shift back out.

Q Okay. Jumping down to Division Chief of Engineering under the Department of Defense McClellan Air Force Base, 1985 to 1990.

Do you see that?

A Yes.

Q Can you please tell us a little bit about that work?

A Okay. So McClellan Air Force Base had a very bad contamination problem. It's an Air Force/Army flight depot, and for years they had been discarding all of their chemical waste into big pits on the west side of the base.

So they were challenged with trying to do something about cleaning up that when it started contaminating groundwater wells west of the base. And they hired me to come on initially to consult with them about what to do about the groundwater contamination.

They immediately offered an employment position, which turned in to a job of not only dealing with the immediate problem but of developing a model environmental program for the Department of Defense; so I helped them set that up. And I started in the Superfund side.

I got that going, and I moved over to the RCRA program and implemented that. Then I was in charge of the air emissions program in addition to RCRA; so basically I was writing and developing programs to put that in place. And then that was -- that program was proliferated to the rest of the depots and later to the rest to the Department of Defense facilities.

Q Okay. And did that job have any involvement with natural gas infrastructure facilities?

A No.

Q The next item down is "Environmental Contractor Invictus Corp." There is no time period for this.

Do you have a time period?

A That was my own company. 1982 to '85.

Q And this is the -- is this the same company that you were referring to when we were discussing groundwater contamination work under "Specialties"

before?

A Yes. And it had another name. It was -- seems like it started out as Clemen Environmental Services and may have continued to exist during the time I was at the Department of Defense.

Q The company continued to exist?

A Yes.

Q So this is a company you started and then left when you joined the Department of Defense?

A Well, I mean it was my own company.

So if you look at this, it started in 1993 as Clemen Environmental Services, and then I continued to carry contracts, consulting contracts, including with the PUC while I was at McClellan at the Department of Defense.

Q I'm sorry, can you slow down for one moment. I think you said you see where it references Clemen in 1993. And I don't see --

Forgive me if I'm missing it, but I don't see where you're pointing to on the document.

A I'm sorry, Deputy Director 1993 to 1995.

Q Yes.

A Okay. So Division Chief of Engineering is 1985 to 1990 so there is a three-year period in there. That was also an active environmental period

which would have been under Invictus Corporation.

Q Okay. So --

A So I'm saying, okay, let's --

The starting date for Clemen Environmental Services, which is Invictus Corporation, because that was before it was incorporated, is 1983. And so if you put 1983 to 1993, that would be the period of time that the dates that would go behind Invictus Corporation.

Does that make sense?

Q So just to confirm, the dates that should go immediately to the right of the environmental contract line should be 1983 to 1993?

A I think that's the best.

Q Okay. And the Invictus Corp work continued for a period of three years while you were also Division Chief of Engineering for the Department of Defense?

A Yes.

Q Okay. And you indicated that you had contracts with the PUC?

A Yes.

Q That was with Invictus?

A The contract itself was either with Clemen Environmental Services or Invictus. I actually don't

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remember the date of the incorporation for that and the name change. But it's all the same thing. It was a private company that was then incorporated in the State of California and then the name --

Q How do you spell Clemen?

A C-L-E-M-E-N.

Q So Clemen is not identified on here. Invictus Corp is.

But Invictus Corp and Clemen are one and the same?

A Yes.

Q How many appointments did you have with the California Public Utilities Commission approximately?

A Well, let's first finish the dates on that one.

So you had to 1993, and then I picked it up again in 1997 to about 2004; so add those dates to the line outside of environmental contractor. And the number of PUC cases, I've never counted those.

Q Approximate, would you say it was, you know, more than 20 contracts?

A I'd say it's right around 20.

Q Okay. And all of these contracts related to groundwater contamination matters?

A No. They -- they were across the board; so

there was a gas plant case, a coal-fired power plant, Helms power plant, which is water storage.

There were three fraud cases involving utilities. There was tree trimming case and pole maintenance. There were two underground storage cases, which was Montebello and Playa del Rey.

Q So I apologize, I don't mean to interrupt, Ms. Felts.

But just to summarize, because I think we will get into some of this in a moment. But to clarify, because I hadn't appreciated this before, the contracts between Invictus and PUC were for expert services?

A Yes.

Q So it wasn't related to engineering work specifically, engineering services related to the groundwater contamination?

A No.

Q Okay. But Invictus also did that work?

A Yes.

Q Not for the PUC?

A Yes.

Q Okay. Was any of --

Do you recall any of the contracts with the PUC for Invictus being for work other than expert

consulting or testifying services?
A No.
Q Okay. Thank you.
Next item down briefly, do you recall the tenure and the dates for "Energy Specialist" at the "California Energy Commission"?
A I think I was there from 1980 to 1983, I think. Late '80 to '83, early '83.
Q And what was your role as an energy specialist?
A I was in charge of the group -- I don't remember the name of the group. It was in -- it was the fuels office, and I was in charge of natural gas and refining forecasts.
Q This was forecasting work related to supply and demand?
A Yes.
Q So this did not relate to energy infrastructure integrity?
A No.
Q Or to particular incidents?
A No.
Q Okay. Next item down it identifies you as a process engineer for Celanese -- apologies if I mispronounce this, Celanese Plastics and Specialties?

A Yes.
Q What did you do as a process engineer?
A I was one of two engineers at a plant in West Texas, Vernon, Texas that manufactured guar powder, which was produced in mass specially for the oil industry for fracking.
Q What was your specific role with respect to the production of guar?
A Well, it was an interesting process plant where we -- I had to grind a bean basically -- guar is an agricultural product, and we had to grind it into a dry powder; so in the meantime in order to get the properties that were required of that powder as an end product, it had to go through a reactive process where there was a chemical reaction to give it those properties.
So I was in charge of the process from front to end to get that to happen and just day-to-day engineering problems at the plant. And also handled environmental problems related to their waste treatment and air emissions.
Q And how many years were you in that position?
A About two.
Q And finally it appears that you were a

process engineer for Amoco Oil Company in Yorktown. Is that Yorktown, Pennsylvania?

A Virginia.

Q "Virginia"?

What did you do as a process engineer for Amoco?

A Again, worked a variety of refining engineering projects; so I was trained to run their linear program on the major -- on the mainframe, which was linked to I think Whiting.

Anyway, they had five refineries so the mainframe linear program was set up so that all of the oil movements that went from one refinery to the other and the production of the products was coordinated.

And so I was in charge and spent a lot of my time managing the inputs and outputs of the refinery and making sure that those specs of the products met the requirements for the outgoing demand; so we had a large product slate. It was a full-fledged refinery, and everything had to balance. And then also dealt with the blending of crude oils, because at that refinery we were using both domestic crude and foreign crude. And so it was an interesting project.

Q And how long were you in that position?

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A About three years.
Q Okay. And was that your first job out of graduate school?
A Out of engineering school.
Q Out of engineering school.
What year do you recall you would have started that? Would it be '70 -- mid-'70s?
A 1977.
Q Okay. And then below that we see "Education," and it appears that you are an attorney, and you got your law degree from the Pacific McGeorge School of Law; is that correct?
A Yes.
Q And you got your MS in energy environmental engineering from LaSalle?
A Yes.
Q Are there any other degrees that aren't listed on here?
A No. I have a certification in linear programming.
Q Certification, any other certifications we should be aware of?
A No.
Q Any other certifications at all?
A I have a general engineering license that is

not on there. It's currently on hold with the State of California.

Q What does that mean?

A It means I pay less because I'm not using it; so it still could be activated in a day if I went down and paid them the extra money.

Q Do you have an engineering license that is active in another jurisdiction?

A No.

Q Okay. Are you --

It identifies you as having a Washington State Bar number.

Is that active or is that inactive?

A Active.

Q Active.

And you're a member of the Phi Delta Phi International Legal Fraternity. Is that a membership or an honor?

A It was an invitation. I have a lifetime membership in it. It's --

Q Impressive.

All right. Turning to the next page, and we'll touch on a few of these but not all.

First question is the first case here identified "2018 - 2019 Oil Company Pipeline Leak,

Client: Private Law Firm."
A Yes.
Q Is this matter concluded in 2019?
A No. It's still open.
Q It's ongoing. Okay.
And is this the same matter -- no, this is an oil pipeline not gasoline.
A It's the same matter.
Q It's the same matter?
A Yes.
Q So this is a gasoline company pipeline leak?
A It's an oil company that owns a gasoline pipeline. They own other pipelines too.
Q All right. And are you able to tell us who the private law firm is?
A No.
Q Okay. Below that, "2016 - 2018 PG&E General Rate Case FERC Docket." I won't read the docket number there.
Do you see that there?
A Yes.
Q And your client on this is the California Public Utilities Commission?
A Yes.
Q Is this related to --

Is this a PG&E electric grate case?
A No. It's the San Bruno case.
Q This is the San Bruno case.
And this case concluded?
A Yes.
Q And what was your work in this case?
A I was the expert witness on a records case -- records-related case.
Q And you submitted testimony before FERC?
A No.
Oh, wait. Are we looking at the same --
Q The first item under 2016 to 2018, second item on the page. It shows "FERC Docket No. ER 16-2320-000."
A This looks like an error in my --
Q Is that a mistake?
A I think that's an error. I don't remember a FERC docket on San Bruno.
Q Could you please correct your resume and send us a corrected one at your convenience?
A Okay. Just a minute.
Q The next item down is "SDG&E CPCN For Pipeline Reliability and safety project."
Do you see that?
A Yes.

Q And this identifies your client as UCAN?
A Yes.
Q And you are UCAN's expert witness; is that correct?
A Yes.
Q And this is an ongoing matter?
A Yes. I am -- can I correct --
I am no longer on that case because UCAN, I don't believe, continued in the case. I don't think they're an active participant in it right now; so they paid me my final payment at the end of the first phase.
Q Which was when?
A It would have been in -- I think it actually ended in the end of 2017, if I recall, and I received my final payment in 2018.
Q Okay. And you prepared testimony that was served in that case, correct?
A Yes.
Q All right. The next item down says "2014 - 2016," and the first item is United States versus Pacific Gas & Electric Company, and it indicates it was related to the San Bruno pipeline explosion criminal case; is that correct?
A Yes.

Q And that your client there was the United States Department of Justice; is that correct?
A Yes.
Q Were you --
What was your role in that case?
A I was a consulting expert, and I helped review records and developed discovery.
Q Okay. On any particular scope of issues?
A It was San Bruno. It was just having to do with recordkeeping and technical issues having to do with the pipeline explosion.
Q Okay. What sort of technical issues beyond recordkeeping?
A I reviewed some of the documents having to do with the original installation and maintenance of the pipeline and maybe some inspection records.
Q Thank you.
The next item down identifies an application ATCO Pipelines, "Urban Pipeline Replacement Project, Client: ATCO."
A Uh-huh, yes.
Q Who is ATCO?
A It's a gas utility in Canada. And their offices are in Calgary, I believe.
Q And who was this proceeding before?

A It would have been the equivalent of the Public Utilities Commission only in Alberta.

Q Okay. And this matter is now concluded?

A Well, my contract is concluded on that. I don't know if the case actually closed yet.

Q Okay. And what was your role in that case?

A Okay. Let's see, the pipeline company wanted to get approval to put in a new pipeline that would be installed in a utility corridor around the city and take out of service existing gas lines in the city that were in -- buried in streets that were lined with housing now. And then they wanted -- they were not going to abandon that service.

They were going to de-rate the lines that were providing service within the city to the low pressure service. And so they were asking for my help in convincing the public sector there that it would be a good idea to move the high pressure gas service to a corridor rather than having it run under their homes.

Q And so you were a testifying expert in that case?

A Yes, for The Gas Company.

Q And you served testimony?

A Yes.

Q Okay. Next item down 2011 to present OII, 1.11-02-016 related to the San Bruno explosion. This appears that your role is ongoing.

What is the ongoing work that you're doing?

A No, it's not ongoing. Old. This is done.

Q When did it --

When was it completed?

A 200- -- 2018.

Q Okay. Can you please add that to the list of corrections to your resume?

Jumping down to the bottom of this column, where it says "Playa del Rey Gas Storage Integrity SoCal Edison" --

A Yeah, that's an error. I knew about that.

Q So that should say SoCalGas?

A Yes. I'll correct that.

Q And the description is "Research and evaluation of data related to the operations, maintenance integrity of the Playa del Rey gas storage facility and the proposed sale of surface property."

And your client was the California Public Utilities Commission Division of Ratepayer Advocates; is that correct?

A Yes.

Q Can you please describe a little bit the scope of your work in this matter?

A It was, again, a records review, and there was --

It was probably a reasonableness case where the Gas Company was asking for some money to cover some costs, and as I recall, there may have been a -- yes; so there was a proposed sale of surface property, and they wanted to -- the PUC wanted an assessment of what the sale of the property would involve as far as technical issues related to gas storage.

And there was also an environmental component of this having to do with contamination in Ballona Creek, I think; so I did an interim or a -- you know, an initial assessment for the Public Utilities Commission, and that's the case that I said I think must have settled because I don't recall a final testimony in that case.

Q So as you recall, the case settled prior to testimony?

A I --

Yes, I'm sure I didn't testify in that case.

Q Okay. And do you recall what the specific integrity issues were that you researched and

evaluated?

A There was --

There were some complaints of leakage of natural gas from wells.

Q Okay. So you reviewed those complaints and related records?

A Records, historical records having to do with the storage unit; so there was a few rounds of discovery. I had quite a few gas documents to review from the utility.

And then I did independent research on the groundwater contamination or groundwater issues. Seems like there was a -- somebody who complained or thought that the gas was coming from a storage unit up through the creek.

It was a private resident who was out there counting bubbles in the creek and then filed a complaint. And so I did some research into prior contamination in the creek that could have been causing that.

Q Did you determine whether or not it was being caused by prior contamination in the creek?

A My -- I think --

As I recall my assessment was that it wasn't coming from the gas storage unit.

Q Okay. And in terms of the reference to integrity here, did it -- it didn't relate specifically to SoCalGas well integrity monitoring practices?

A No, not -- excuse me, not integrity monitoring that I can recall.

There was a problem with one or more wells leaking, and I recall one of the wells actually was vented up through a house, which was crazy. Without being able to look back at data, which I don't have anymore, I can't really tell you much more. I'm just telling you what I remember.

Q What you recall. Okay, thank you.

All right. Jumping to the next column, do you see where it states "Application of SoCalGas Company to sell its storage field in Montebello, California, pursuant to Public Utilities Code Section 851"?

A Yes.

Q And then it says "Evaluation of technical data related to the integrity of the Montebello gas storage field."

And your client again there was the Division of Ratepayer Advocates?

A Yes.

Q Were you a testifying expert in this case?
A I filed testimony.
Q You served testimony that you were not able to locate?
A Yes.
Q For purposes of producing it for today's deposition; is that correct?
A Yes.
Q Do you recall whether it was multiple rounds of testimony?
A I expect there was a rebuttal.
Q Okay.
A But I don't remember actually testifying in that case, and I don't -- testifying at the hearings. I don't know if there were hearings and the case --
My part, my evaluation of it was evaluation of storage unit data and leakage; so the gas storage facility was leaking.
Q Okay. Do you recall whether these were operational or abandoned wells?
A What I recall about my part of -- my study of it was not that it was leaking through wells, which it may have been, but that the storage unit itself was leaking. In other words, the geology wasn't containing the gas.

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Q So integrity here refers to reservoir integrity, not well integrity?
A That's correct.
Q Okay. Thank you.
You identify a number of other cases on your resume.
Are there any others that relate to gas storage that you see here?
A No.
Q Okay. Ms. Felts, you don't identify any publications on here.
Do you have any publications or articles?
A I have a list somewhere. They're really old. I haven't published anything other than testimonies for a long time.
Q Do any of those publications as far as you recall relate to gas storage?
A No.
Q Okay. Ms. Felts, you've been a testifying expert in a number of disputes including regulatory and civil proceedings, correct?
A Yes.
Q And the civil proceedings include both arbitrations and testimony in court?
A Yes.

Q Have your qualifications as an expert ever been rejected?

A No.

Q Ms. Felts, we identified a number of inaccuracies in this resume.

MR. GRUEN: Objection. To the characterization of "a number of inaccuracies" --

But she can answer.

BY MR. STODDARD:

Q Okay. Ms. Felts, we identified inaccuracies related to items on page 2 of your resume, related to the PG&E FERC docket under 2016 and 2018, identification of the utility in connection with the Playa del Rey storage integrity item, as well as on the first page an incomplete account of the tenure for Invictus Corp.

Based on our discussion there should also be time periods between Dames & Moore and the California Communications Association and potentially between the Department of Defense, McClellan Air Force base and the Department of Toxic Substances Control.

Do you agree?

A Do you want me to add dates to make this more consistent on the front page with the time schedule? In other words, you want me to insert

environmental into the periods?

Q Well, what I would like is a complete accounting of your employment history, and based on our questioning a few moments ago, it sounded like there were interim periods of time where your own company, Invictus Corp or Clemen Energy Services, there were tenures -- there are periods of time for work you did with Invictus that should be listed here between other positions.

A Okay. So when I wrote this, I tried to make it easier by putting litigation consultant 1983 to present to cover that because all of those interim periods I was doing litigation work.

So, I mean, I can rewrite it so that it covers all date periods.

Q If you could clarify and confirm that that's accurate, we would appreciate it. And then make the corrections that we discussed on page 2, and then please confirm whether this is otherwise complete and accurate.

As you sit here today, to your knowledge, is this otherwise a complete and accurate record of your employment history and testifying experience and education?

A Yes. I looked at it, and I don't think

there are any more -- any other errors.

The one I spotted was the Playa del Rey.

I didn't notice that I needed to fix the date on the OII.

And the FERC case, I have to -- I have to look up the number because I just don't remember what that is.

But I'll fix it.

Q Thank you.

Yes, so to confirm, as you just noted, it is three items on page 2 related to the date of the San Bruno investigation, the FERC docket and the Playa del Rey storage field.

A Right.

Q All right. Thank you very much.

Ms. Felts, do you have any operational experience with gas storage fields?

A No.

Q Have you ever worked for a gas storage operator?

A No.

Q Have you ever done engineering work for a gas storage operator?

A No.

Q Do you have any experience related to the

design or configuration of gas storage wells?

A Not directly, but the design and configuration of wells in general is not so different.

Q What experience do you have with the design and configuration of wells generally?

A I have designed and drilled water wells for groundwater monitoring and --

Well, that's all for generally.

Q Okay. And how deep are those wells usually?

A I think the deepest one was actually -- was probably about -- I'm trying to think, about 400 feet shallow wells.

Q And do they have surface casings?

A Yes.

Q And production casings?

A Yes. Depending on what you're drilling through, you have to design it properly so that you isolate the different sands or lenses, clays; so it just depends on what you're drilling through how you design the well.

Q And do they have tubing and packer configuration?

A Generally not necessary; however, I did study drilling in engineering school.

Q Okay. And when you say you studied drilling, you studied gas storage well design and configuration?

A Gas and oil -- oil and gas well drilling.

Q So gas production?

A It would be gas production, yes.

Q Okay. Do you have experience with gas storage well integrity monitoring?

A Not sure what you mean by that.

Q Well, in your testimony you have discussion about well integrity monitoring, correct?

A Say that again.

Q In your testimony you address SoCalGas's well integrity monitoring programs; is that correct?

MR. GRUEN: Just for clarification, when you're going to be asking about testimony, can the witness be directed where in the testimony she is being asked?

MR. STODDARD: Yeah. We can circle back on that.

Q Ms. Felts, what is your understanding of the phrase "well integrity monitoring"?

A I think that is a phrase that either or both SoCalGas and Blade used.

So my understanding of it, it's the

monitoring of the well for -- to make sure that it is not leaking or has not lost wall thickness from corrosion or erosion, and is behaving or -- as intended.

Q Okay. And do you have experience with that process? Have you personally performed well integrity monitoring?

A Well, that's kind of a weird question because well integrity monitoring, although you would have to have field testing to do, you would -- the monitoring itself would be a matter of record assessment.

So data assessment. So you would hire someone to come out and run the tests on the well.

An engineer would look at the results of the test, and I would guess that the integrity monitoring aspect of it would be on the engineering side where you would be evaluating the data that was generated from the well. And the engineer could call for the tests, and my experience would be in reviewing data.

Q What sort of tests are you referring to?

A Well, could be logs of the well, various types.

Could be a -- the use of a tool like a USITs I think they call it now, to determine the wall

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thickness of the well.

Could be a temperature survey, a noise survey, they also have some tests for erosion, involves --

Q And do you have experience interpreting casing inspection logs prior to your work in this matter?

A Yes.

Q What was that experience?

A I've looked at casing inspection logs in a number of cases in the past where there were issues of groundwater contamination, and it would be related to an oil production well or a --

I can't remember a gas production well. I think only oil.

Q Do you recall what sorts of casing inspection logs, what the tool was?

A What the tool was?

It was a tool that would monitor -- it would measure the wall thickness of the pipe, the casing. Typically that would be what I would look for.

MR. GRUEN: I'm sorry, I'm just noting just for timing sake, we can keep going, but I'm wondering if you have an idea when you might like to break.

MR. STODDARD: We can take a break after

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probably another 10 minutes.

MR. GRUEN: Does that work for you?

Okay.

BY MR. STODDARD:

Q So your interpretation -- I'm sorry, again.

Do you recall the types of tools that were used in that specific instance related to the oil production well?

A I'm going to say that it was similar to the USIT one that SoCalGas is using, but I don't remember the name of the tool.

Q Okay. Any other experience interpreting casing inspection logs?

A Not that I recall just offhand, no.

Q And in interpreting the -- in interpreting the casing inspection log in that instance, do you recall being present at the time that the log was run?

A I have never been present when a log was run on an oil or gas well.

Q Okay. Do you recall communicating with the wire line operator about running the tool that resulted in a log that you interpreted?

A No.

Q Okay. And do you recall approximately when

that was that you interpreted the log related to the oil production well?

A I recall that there was more than one well that I did this on, and I -- I'm going to say it's probably during the 1990s. I don't have a date.

Q Okay. And again, this was based entirely on review of the records?

A Yes.

Q Okay. Do you have any experience with microbially influenced corrosion?

A Yes.

Q Can you please describe your experience?

A It has to do with underground storage tanks that leaked, pipelines that leaked, everything underground exposed to groundwater that I was requested to look at that leaked.

Q So you have experience with it in a number of cases?

A Yes.

Q Do you recall --

Did you perform any testing or analysis related to MIC?

A No.

MR. GRUEN: Just for the record, "MIC" is what is the --

BY MR. STODDARD:

Q I'm sorry, I'm using the phase "MIC" as the acronym for microbially influenced corrosion.

A Yes.

Q Did you perform any testing or analysis related to MIC?

A No.

Q Okay. Finally, Ms. Felts, do you have any experience with well-control or well-kill operations?

A No.

Q Ms. Felts, do you have any experience with --

You're an attorney, correct?

A Yes.

Q Have you ever been involved in a discovery dispute as an attorney?

A No.

Q "No"?

Have you ever been involved in a privilege review?

Do you understand what I mean by "privilege review"?

A Yes.

MR. GRUEN: I'm going to just --

THE WITNESS: Only as a side --

1 You know, I'm a consultant, there is a
2 privilege review issue, but I'm not the one that gets
3 involved in settling it.
4 BY MR. STODDARD:
5 Q So as an attorney, you've never overseen a
6 privilege review?
7 MR. GRUEN: All right. For the record, I'm just
8 going to note an objection as to relevance in asking
9 her about her role as an attorney here.
10 But she can answer the question.
11 MR. STODDARD: The relevance is her testimony
12 asserts violations related to privilege; so I'm
13 asking her about her scope and experience and
14 knowledge related to the subject matter.
15 THE WITNESS: I'm familiar with the subject
16 matter. It's generally not my responsibility as a
17 technical consultant.
18 BY MR. STODDARD:
19 Q Okay. So you've never prepared a privilege
20 log?
21 A I don't think that's true. I think I
22 probably have prepared one in the past.
23 Q You've prepared a privilege log as an
24 attorney?
25 A No, as a technical --

Q You've prepared a privilege log as a technical consultant?

A Yes. I mean, this is a matter of identifying records, and the condition -- the -- whether or not the records are privileged, and if someone asked me to prepare a log, I could prepare the log.

Q So in that context of preparing a log as a technical consultant, you assess the privilege and then you designate the documents accordingly?

A I don't have to usually assess the privilege because it's usually already assessed before I get to it. Someone has already claimed privilege.

Q And then in reviewing the documents you add them to the log and determine that they fall within the scope of the privilege claim?

A Yes. Or I sort -- sort a stack of them and say these are privileged and these are not.

Q Ms. Felts, can you briefly describe your experience with PUC enforcement investigations, prior experience with PUC enforcement investigations?

A I guess I would have to look back at my resume to see who it was that I was working for on the different cases.

Q Let's do that briefly, and I'll make it

quick, Exhibit 1-2.

First on page 2 of Exhibit 1-2, the OII related to San Bruno, was that an enforcement investigation?

A Yes. Yes, it was.

Q Okay. Next down, the Playa del Rey gas storage integrity case at the bottom of this page, was that an enforcement investigation?

A That was Division of Ratepayer Advocates, so I would say no. That was a reasonableness case.

Q And it was related to a sale of property?

A Yes.

Q And then the next item on the next page, the application of Southern California Gas Company to sell the Montebello gas storage field, that also was an application for a sale of an asset, correct?

A Let me see, Montebello.

Q This is on page 2 of your resume in the second column.

A Oh, okay. Okay. That was also for the Division of Ratepayer Advocates, so that would have been a reasonableness review.

Q And it says there it's an application, correct?

A Yes.

Q Okay. Have you ever worked as an attorney in a regulatory investigation?
A No.
MR. STODDARD: All right. Thank you.
We can take a break.
THE VIDEOGRAPHER: Just a moment, please.
This is the end of disk number one, Volume Number 1, of the deposition of Margaret C. Felts on February 5th of the year 2020.
We are off the record at 10:55 a.m.
(Off the record.)
THE VIDEOGRAPHER: This is the beginning of disk number two, Volume Number 1, of the deposition of Margaret Felts on February 5th of the year 2020.
We are on the record at 11:13 a.m.
MR. STODDARD: Ms. Felts, actually, I'm going to mark Exhibit 1-3.
(Deposition Exhibit 1-3 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Ms. Felts, do you recognize this document?
A Yes.
Q Is this your contract with the California Public Utilities Commission related to your work in

this matter?
A Yes.
Q Do you see where it says "Start Date October 21, 2019 or upon DGS OLS approval, whichever is later"?
A Yes.
Q Is that the date that this document was mailed to you?
A What date?
Q Is October 21, 2019 the day that you received the contract?
A I don't know.
Q I'll direct you to the bottom of the document where it shows your signature with the date signed of November 5, 2019.
Do you see that?
A Yes.
Q And on the next page it shows a signature from the Department of General Services with a stamp of November 7, 2019.
Do you see that?
A Yes.
Q Okay. Do you recall whether you received this document weeks prior to the date that you signed it?

A I would have received it --

I think I received it a week before this signature date because I signed one and returned it, and then I was notified about five days later that there was an error in the way it was written. Something was omitted so GSA had sent it back and I re-signed it; so this is the second signature of mine.

So there was an iteration in there about a week's turn around. I don't remember the exact date when I received the first draft of it.

Q Okay. Do you recall how it was transmitted to you?

A By email.

Q "By email."

From --

MR. GRUEN: I'm going to note an objection to the extent that calls for attorney-client privilege.

Notwithstanding, I think you can answer that question, if you're able to.

THE WITNESS: So the process here is that the first draft is provided by email for me to review, and then I would return that, possibly with an electronic -- a scanned version with the signature.

When they get the contract ready to be

signed officially, they mail it overnight mail to me, and I wet sign it. And I send it back by, you know, overnight mail.

BY MR. STODDARD:

Q When you say "they," do you mean the California Public Utilities Commission?

A Yes. The contracts officer, yes.

Q Do you recall who the contracts officer was?

A I think her name was Peggy Owens. Peggy Owens.

Q Okay. Did you correspond with SED personnel related to this contract?

A No.

Q Were you contacted by SED personnel prior to executing this contract related to the engagement?

A I was only contacted by the legal office.

Q Okay. So prior to signing this contract, you had not had any -- strike that.

In connection with this engagement, prior to signing this contract you had not had any contact or communications with SED personnel about this matter?

A That's correct.

MR. GRUEN: Can I just clarify it?

By "SED personnel," can you clarify that term?

MR. STODDARD: Thank you. Yes.

Anyone that Ms. Felts is aware is part of the SED department.

Q In other words, staff that would be assigned to SED or counsel working in this matter representing SED, including Darryl Gruen, Amy Yip-Kikugawa or Nicholas Sher.

A Okay. I had communications with Karen Shea and later with Darryl Gruen after the contract was signed.

Q Okay. So you had communications with Karen Shea prior to the contract execution about your engagement in this matter?

A Yes.

Q Okay. Do you recall if those were email communications?

A They would have been email communications. Maybe a phone call.

Q Okay. I don't believe we have those email communications to the degree there are any.

Ms. Felts, I'm going to direct you to Exhibit A of the contract. It's on page -- it begins on page 3. It's the "Scope of Work."

A Okay.

Q Do you see below where it says "Write

opening reply and rebuttal testimony as an expert witness on behalf of the PUC's Safety and Enforcement Division, and based on results of this analysis testify in relation to that testimony at hearings if necessary."

Is that correct?

A Is that at the bottom?

Q I'm sorry, paragraph 5a.

A Okay. I see it.

Q About halfway down that indented paragraph --

A Yes.

Q -- do you see where it refers to you as an expert witness on behalf of the CPUC Safety and Enforcement Division?

A Yes.

Q And then the next sentence which says in preparation for testimony you will provide extensive review of Southern California Gas Company records as necessary to assess compliance with safety requirements?

A Yes.

Q And then turning to the next page of Exhibit A, this is page 4 of the document.

Do you see where it says in paragraph h that

your scope of work includes discuss, support and review legal briefs, motions and other legal and procedural documents as necessary.

A Yes.

Q And in paragraph i where it States, "When necessary, provide and manage subcontractors who may provide necessary technical services and support to SED"?

A Yes.

Q Are you aware of any subcontractors engaged by SED in this matter?

A Do you want to restate that again?

Q Paragraph i states that "When necessary, provide and manage subcontractors who may provide necessary technical services in support to SED."

Do you see that?

A Yes.

Q Are you aware of any subcontractors in this matter?

A Those would be subcontractors to my contract?

Q Or to SED.

A I would not know what SED is doing, but I believe this has to do with if I hired someone to help me as a subcontractor.

Q I'm not asking about your interpretation of the provision so much as asking whether you have been doing work related to providing or managing subcontractors related to technical services in support to SED in this matter.

MR. GRUEN: I'm going to object to that as overly broad, just to the extent it calls for subcontractors which are outside the scope of Ms. Felts' contract.

So one option is to restate that. Or if you want, you can ask her to answer as you've worded it.

MR. STODDARD: I would ask --

Okay, I'll restate in a few different questions.

Q One is have you engaged any subcontractors pursuant to your contract?

A Not yet.

Q Okay. Have you worked with any other subcontractors in this matter engaged by SED?

A No.

Q Do you intend to engage any subcontractors?

MR. GRUEN: I'm going to object to the extent that calls for attorney work product privilege.

And I'm going to instruct the witness not to answer the question.

It also may -- just for the record, that may involve attorney-client privilege as well.

BY MR. STODDARD:

Q Okay. Ms. Felts, what did you do today to prepare for today's deposition?

Did you review any documents?

A I read through the opening testimony.

Q Did you meet with anyone -- I'm not asking you to divulge attorney-client privilege information.

Did you meet with anyone aside from your counsel?

A No.

Q Did you review the exhibits relied upon in your opening testimony?

A I reviewed some of them.

Q Did you review any discovery, data requests and data responses?

A Yes.

Q Do you recall which ones?

A I couldn't give you an exact list, but I looked at some well files.

Q Do you recall which wells the well files related to?

A Well, I assessed 25, 25-A, 25-B, 6, but I'm not sure if it was an SS-6 or another one.

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Q Okay. Did you prepare any written materials in preparation for this deposition?
A No.
Q And I apologize for jumping around, but I'm going to refer back to -- it's not exactly necessary, but I'm referring back to your contract which is Exhibit 1-3, and I would just like to confirm do you have any other current contracts with the California Public Utilities Commission?
A No.
Q Do you have any other current contracts with the State of California or any agency or department --
A No.
Q -- thereof?
A No.
Q At the time that you were engaged in your contract, did you understand the scope of your work to be to provide expert testimony in this matter?
A Yes.
Q What did you understand the scope of issues you were to address to be?
A What's described here in this scope of work. That is what I was asked to do.
Q Did you believe that it related to records

review?
A Yes.
Q Did you have prior awareness of the Aliso Canyon incident?
A Yes.
Q Had you reviewed records related to the Aliso Canyon incident prior to your engagement?
A I did not have access to anything other than what was publically available.
Q Did you review what was publically available?
A Yes. I had a file I was collecting stuff in.
Q When did you begin collecting stuff?
A About the time the incident began.
Q Why were you collecting stuff?
A Well, historically I usually get called sooner or later on these things; so I had an interest in it.
Q So you expected to be appearing as an expert witness in this matter before you were engaged by SED?
A Well, it was a possibility. And I'm a consultant.
Q Do you recall the sources that you went to

for those public records?

A Well, I signed up for SoCalGas's regular news, the little news releases that came out, came across, I think on email. I started following a different proceeding having to do with the potential closure of the gas storage unit. And so I --

When I went to the PUC and signed -- you know, electronically signed up for -- to be a party -- not a party, but to receive the information on that case -- and I don't remember the case number, I'm sure you know it --

So I received regular information about that case and kind of followed it. And may or may not have kept records that came through from that.

Q But you -- I mean, you said you "collected" it.

Did you save it in a file on your desktop?

A I would have -- I don't --

I think I probably just saved the emails that came in an email file folder.

Q Okay. And did you review these materials when you were preparing your testimony?

A No. They're not useful for this.

Q Why not?

A Well, I have plenty of data that has come

through discovery on this case to look at without going to some other source right now.

Q Okay. Aside from the scope of work described in your contract, were you engaged in any other capacity by SED to work on this matter?

A No.

Q Has SED utilized you in any other capacity in your work on this matter?

A No.

Q Ms. Felts, were you involved in SED's preliminary investigation related to the Aliso Canyon's incident prior to the initiation of the formal OII?

A No.

MR. STODDARD: I'm going to mark Exhibit 1-4.

(Deposition Exhibit 1-4 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q This is an email from Mr. Gruen to you and Ms. Shea sent on Friday, November 8th at 9:19 a.m.; is that correct?

A Yes.

MR. GRUEN: If I may, I just noticed, I'm noting that because the document is identified as Public Utilities Code Section 583, that to the extent questions elicit information from Ms. Felts that are protected by PU Code Section 583, we would look to SoCalGas to properly mark that as confidential.

MR. STODDARD: Understood.

Q And Ms. Felts, it appears that this included attachments which were transcripts of examinations under oath conducted by SED; is that correct?

A Yes.

Q Is this the first email that you received from SED in connection with this matter?

A Well, I'd say November 8th would be -- it would have to be the first, or there may have been others that came on that date. I didn't receive anything before this.

Q Earlier you stated you had email communications with Ms. Shea prior to your execution of the contract.

A Well, I think I did about the contract, that was -- she was handling that coordination with the contracts office with Peggy.

MR. STODDARD: Okay. Darryl, while we're on the record, if you'd like us to submit a written request

or follow up with our prior request for all communications, we can do so.

But I prefer to just state it on the record that you confirm the date of the first email communications and produce any additional communications between Ms. Felts and SED personnel or SED counsel.

MR. GRUEN: Yeah. I mean, I think we would like to have -- it's noted for the record, of course.

But we appreciate having something in writing as well if there is an indication that there is something that you have not received.

MR. STODDARD: Okay.

MR. GRUEN: And perhaps just for our understanding if you think that's the case, if you could clarify the dates, just so we understand what dates you're looking for.

MR. STODDARD: We appreciate that. We'll provide that. We don't know the dates of prior emails, which is what we're getting at.

MR. GRUEN: Okay.

BY MR. STODDARD:

Q Since your initial engagement, who have been your primary points of contact for SED?

A Darryl and Karen.

Q "Darryl and Karen"?
Have you also spoken with Mr. Sher, Nicholas Sher, counsel of SED?
A No, not yet.
Q Have you emailed with him?
A No.
Q How about Randy Holter?
A Don't --
I don't know who that is.
Q You don't know who that is.
Matt Epuna?
A No.
Q E-P-U-N-A?
A No.
Q Maria Solas?
A Maria Solas.
No.
Q Lee Palmer?
A No.
Q Bear with me, I'm going to ask some more names.
Amy Yip-Kikugawa?
A I know Amy. I have not communicated with her in years.
Q You know her from prior matters?

A Yes.
Q Is that from San Bruno?
A I think so, yes.
Q How about Ken Bruno?
A No.
Q Jack Mulligan?
A No.
Q Mitch Chafsome?
A No.
Q Have you communicated with anyone from the California Advocates office, the Public Advocates Office, formerly know as the Division of Ratepayer Advocates and several other names?
A Yeah, I was going to say --
Q Have you communicated with anybody from Cal Advocates relating to this matter since you were engaged?
A No.
Q Have you communicated with anyone from Cal Advocates about this matter before you were engaged by SED?
A Ever?
Q Related to the Aliso Canyon incident, to your knowledge.
A No.

Q And since you were engaged have you spoken with Blade, anyone from Blade Energy Partners?
A No.
Q Before you were engaged but following the Aliso Canyon incident, did you have any contact or communication, to your knowledge, with anyone from Blade Energy Partners?
A No.
Q Okay. So based on what you said earlier, and correct me if I'm wrong, it sounds like your only points of communication with SED have been Darryl Gruen and Karen Shea; is that correct?
A Yes.
Q And you communicate via email?
A And phone.
Q And phone; do you text, text message?
A I sent Darryl a first text message this morning to tell him that I got here.
Q Okay. Do you communicate by via mail, hard copy?
A No.
Q "No."
In-person meetings?
A No. I live in Colorado. This is the in-person meeting.

MR. STODDARD: Okay. I'd like to introduce Exhibit 1-5.

(Deposition Exhibit 1-5 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Appears to be an email to me.

Q That is correct. It's an email from Darryl Gruen to you on November 8th, the same day as your first -- well, the same day as the prior email that we discussed --

A Yes.

Q -- related to the EUO transcript.

And this one, the subject line is "Scoping Memo Recordkeeping Language."

At that time was it your understanding that you were being engaged for the purposes of assessing SoCalGas's recordkeeping practices?

A I think that was part of the engagement, yes.

Q Was it your understanding that that was your primary purpose of your engagement in this matter?

MR. GRUEN: Objection. Just use of the word "primary" is vague.

Can you clarify?

MR. STODDARD: Sure.

Q At the time of your initial engagement, and we'll have to be a little bit -- you know, within the first few days of signing the contract, during your initials discussions with SED, was it your understanding that you were being engaged based on your experience with recordkeeping in other utility investigations?

A I think my understanding was that my recordkeeping experience was important to them to be able to look at recordkeeping issues, but also to look at other issues that had arisen through the Blade investigation.

Q Do you recall asking Darryl to send you the specific scope language related to the recordkeeping issue?

A You're asking me if I sent him an --

Q It appears --

A -- email before I got this?

Q Yeah, whether an email or a phone call.

It appears that this email was sent -- there is no context for this document.

A And I don't remember a context to it. I don't remember why he would send me only the

paragraph 4, especially since I think it's in the contract.

Q Do you recall having a phone call about it?

A It's possible. It's possible because he called me right as soon as the contract was signed, and we both received copies of the contract by email; so it's possible that there was some discussion and he sent this as a result of a request or something or maybe clarification. I'm not sure.

Q Okay. Approximately how frequently do you communicate with either Darryl or Karen?

MR. GRUEN: I'm going to just object to the extent that that calls for attorney-client and attorney work product following the publication of the opening testimony.

But to the extent that we're talking about communications prior to the publication of the opening testimony, she can answer.

BY MR. STODDARD:

Q Prior to the publication of the testimony, how frequently did you communicate with either Darryl or Karen? I mean approximate.

A So after the contract was written -- was signed, I -- my communications with Karen diminished to only being able to get access to databases at the

PUC. There was some logistics that was involved in doing that, and I was having difficulty remotely; so that's what was happening there.

And then -- and when the contract was signed, then I heard from Darryl. And I would say we probably communicated daily between then and when the opening testimony was sent. But I don't know exactly. I looked at all of the emails that Darryl copied to you, and as far as I know, that was complete -- a complete set.

Q So daily communications could have been phone and email?

A Possibly, yes.

Q Do you recall multiple times a day?

A Possibly during that period of time because it was a very short lead time. I was trying to look at as much stuff as I could before the testimony was due to be filed.

Q You mentioned having trouble accessing databases at the PUC.

A Yes.

Q Do you recall the specific databases?

A There is a database called Diamond buried somewhere in their system.

Q What kind of database is that?

A It's the one where all of your responses were supposed to be housed.

Q That's a file management system?

A Yes.

Q And you had to be granted access to it because you were remote?

A Well, all of the data in response to data requests was provided to the PUC, I guess, either by email or -- and/or thumb drives. That information was all uploaded to this database at the PUC on their mainframe. And the idea was for me to be able to call in and review records there remotely.

It was obviously too voluminous to print out and send me boxes of paper; So I did receive the responses to DR 16 in paper. I believe Karen sent that to me.

Q Do you recall about when you successfully gained access to the PUC's database?

And, again, I'm not asking for a specific date here; it's more relative to your engagement or your opening testimony.

A I would say sometime right around the time the testimony was filed.

Q Before? After?

A I don't know without looking back at the

dates on the -- on the emails, but I would say maybe a couple of days before.

Q Okay. And before you gained access to the Diamond database, any documents that you would have been -- that SED would have transmitted to you would have been via email?

A No. I don't think I got any data responses by email before then.

I had the Blade reports, which was a lot of reading and review. And so I had -- I had the transcripts that were emailed to me that you just saw in this last email.

And then I had the paper copies of DR 16 to look at, which included a set of the daily reports for Boots & Coots drilling. And I think that's primarily what I had to look at initially, which --

And so a full set of the Blade reports included all of the supplemental reports; so it was a complete set of the volumes of that.

Q And did the PUC -- or SED, I'm sorry.

Did SED share anything with you via FTP?

A Not at that time. I didn't have an FTP access until probably at least three weeks after my contract started, and then I was able to FTP large files.

Q The Blade report, where did you obtain that on the Aliso Canyon's web page?

A No, I couldn't download it, but I had tried actually when they started to talk about the contract, and the only thing I could get was the main report; so the rest of it was mailed to me in hard copy. Karen sent it to me.

Q Okay. Was anything else mailed to you in hard copy?

A The responses to DR 16.

Q Okay. Do you recall the approximate date that you received the Blade report in the mail?

A I think it was mailed overnight mail right after the contract was signed.

Q And you reviewed it after you received it?

A Yes.

Q Do you recall how long it took you?

A There are days when I'm still reading on it.

Q Did you review other preliminary investigation -- preliminary SED investigation records aside from the documents that we've just discussed --

A No.

Q -- prior to preparation of your opening testimony?

"No"?

So the records produced by SoCalGas would have been limited to those that were shared with you by SED between the contract date and the date of your opening testimony?

A I -- I had to have had access to the Diamond database at least a couple of days before because I spent at least a day looking through the SS-25 well file. And it was the first file that was provided to -- in response to a data request. I think it must have been in response to the Data Request 1.

It was a file of individual -- each page was an individual PDF. That is the well file that I reviewed before the opening testimony was filed.

Q Do you recall reviewing any other records in the Diamond database aside from the well file prior to your -- to service of your opening testimony?

A I believe I read there was -- there were copies of the Data Request 1 and a Data Request 1 that was SED and D-O-G -- DOGGR, and Data Request 2; so I think I only reviewed the response attachments, the data, for DR-1.

Q Thank you.

Did you review the Public Utilities Code prior to preparing your opening testimony or prior to

serving your opening testimony?

A I reviewed Section -- is it 451? The safety section, whichever that one is.

Q That's it?

A That's it.

Q Did you review the Commission's Rules of Practice and Procedure?

A No.

Q Did you review any internal SED legal research or analysis?

A No.

Q Since you've been engaged by SED, we talked about the scope of work a little bit earlier in your contract.

Since you've been engaged by SED, have you assisted with preparation of any pleadings?

A No.

Q Data requests?

A Yes.

Q Data responses?

A Yes.

Q Did you review any draft SED reports related to findings of their preliminary investigation?

A What would that be?

Q Any documents that include findings,

summaries of evidence, alleged violations.

A Other than the draft filing, the draft opening testimony?

Q Other than the draft opening testimony.

A No.

Q Earlier we were talking about the Blade report. I'm going to briefly check to just see if you've had any contact with any of the individuals.

Will you allow me to just name the names?

If she doesn't know them, she doesn't know them. If she does, she does. I'm not going to enter this as an exhibit right now.

MR. GRUEN: No objection.

BY MR. STODDARD:

Q Ms. Felts, do you know Ravi Krishnamurthy?

A No.

Q Have you ever spoken to Mr. Krishnamurthy?

A No.

Q Have you ever had email contact with Mr. Krishnamurthy?

A No.

Q How about Nigel Alvares?

A No.

Q Greg Asher?

A No.

Q William Bacon?
A No.
Q Miodrag Bogdanovic?
A No.
Q Ismail Ceyhan?
A No.
Q Ming Gao?
A No.
Q Bill Whitney?
A No.
Q Shree Krishna?
A No.
Q Are you familiar with Ecolise, an entity named Ecolise?
A No.
MR. GRUEN: I'm sorry, can you clarify, is that a person?
MR. STODDARD: No, that's a company. Ecolise.
MR. GRUEN: Okay.
BY MR. STODDARD:
Q Liz Summer, do you know her?
A No.
Q How about Jerry Shursen?
A No.
Q Or GSM Oil Field Services?

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A No.
MR. STODDARD: We're going to introduce Exhibit 1-6.
(Deposition Exhibit 1-6 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Ms. Felts, have you seen this document before?
MR. GRUEN: I'm sorry, can we just give the witness an opportunity to review this?
MR. STODDARD: Yes.
THE WITNESS: I don't think I've ever seen this.
BY MR. STODDARD:
Q Okay. It's an email from Bob Pilko to Randy Holter and Bill Whitney with Ravi Krishnamurthy, Cyndy Reed and PV Suryanarayana copied, and it's from January 28, 2016.
Do you know, have you --
Do you know Bob Pilko?
A No.
Q Have you ever had contact with Bob Pilko?
A No.
Q Do you see below where it states --
It's an email from Randy Holter and says

"Hello Bob, I want to introduce myself for as the Lead Investigation for the CPUC on the Aliso Canyon Storage Facility SS-25 Well Leak."

A Yes.

Q Were you aware that Randy Holter was the lead investigator for SED on the matter?

A No.

MR. GRUEN: I'm going to just object to that as the characterization is vague as to time; so just the question was asked in the present tense.

BY MR. STODDARD:

Q Are you aware that Mr. Randy Holter at any period of time is or was the lead investigator in the Aliso Canyon matter?

A I don't really know anything about the case prior to me coming on it.

Q And you earlier said you haven't had any contact with Mr. Holter, correct?

A I don't know who that is. No.

Q Okay. Are you aware of any other individual for SED being identified as the lead investigator or having the role of lead investigator at this time?

A Right now?

Q Yeah.

A I don't know who might have that

designation.

MR. STODDARD: Okay. I'm going to introduce Exhibit 1-7.

(Deposition Exhibit 1-7 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q This is your --

This is the opening testimony of SED in the Aliso Canyon investigation proceeding, correct?

A Yes.

Q And if you look at the top left corner it identifies the docket number, the commissioner, the administrative law judge.

It does not identify you as the witness; is that correct?

A Right.

Q And there is no witness identified; is that correct?

A Looks like that's correct.

Q Do you have any changes to your testimony at this time?

A No.

Q You said you reviewed this in preparation for today's deposition, correct?
A I reviewed part of it.
Q Which part?
A Let's see if I can find it.
Starting at page 51 I read that last night.
Q Okay. So you started reviewing the testimony immediately after the sections that deal with the Blade report; is that correct?
A Yes.
Q Why didn't you review the sections that deal with the Blade report?
A I felt like I could answer questions about that so I didn't need to refresh my memory.
Q Okay. Did you write this?
A No.
Q Who did?
A Well, let me take that back.
I wrote part of it. I wrote the recordkeeping section. And the rest of it was already drafted when I arrived on the scene.
Q Do you know who wrote it?
A No.
Q Who did you receive it from?
A Darryl.

Q Did you ask who wrote it?
A No.
Q So you didn't want to speak with the person who prepared the testimony to ask them questions about why they included certain information?
A I just read it and felt like I understood what they were writing about. I didn't feel it was necessary to track down authors.
Q But you are sponsoring it as your own testimony, correct?
A I was asked to sponsor it. I read it and I said that I could sponsor it, and so I am.
Q The entirety of the testimony?
A Yes.
Q Okay. It includes --
I mean, it's approximately 80 pages, is that correct, 82 pages?
A Yes.
Q And it includes close to 500 footnotes?
A Yes.
Q Did you review and confirm each of the footnotes?
A I read the footnotes. I did not verify them all. Some of them I went to the source, others I did not.

Q So for everything that is cited in here, you reviewed the document that it was cited to?

A I'd have to look at every footnote to answer that question. Is that what you're asking me?

Q Well, I'm asking whether you were approached to getting yourself comfortable in sponsoring this report included reviewing all of the evidence -- alleged evidence that is relied upon in the document.

A There may be a couple of footnotes that I didn't verify, but generally everything that is tied to the Blade report I verified. If there is something else in here that didn't look like it was necessary for me to verify it, I didn't. There may --

I think there are supporting documents that --

Q The exhibits?

A -- that I reviewed.

Yes, the exhibits that went along with it, which would be, say, in the section that I was reviewing last night, there were some letters and exhibits that were provided, and I did read those.

Q Did you review all of the exhibits?

A Yes.

Q Last night or prior to --

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A No, prior to the testimony right now.
Q Prior to the service of testimony?
A Yes.
Q Did you review those exhibits -- strike that.
Did you --
You didn't speak to Mr. Mansdorfer, correct?
A No, but there is an EUO of Mansdorfer that I read.
Q So you reviewed all of the EUOs?
A I didn't review them all. I think there are still two or three that I have not read completely, and one of those is Brett Lane, and I don't know, maybe Volume 2 of Brett Lane, and I'm not sure about -- but I'm pretty sure there is at least two others that I haven't read.
Q Do you recall if you've reviewed the Boots & Coots witness EUOs?
A Yes, I did.
Q In the process of preparing or getting yourself comfortable with sponsoring the testimony prepared by others, did you keep any handwritten notes?
A No. I just read -- it was very fast paced review because I didn't have much time.

So I was working primarily with the Blade report and with this document to make sure that they were properly drawing -- drawing conclusions out of the Blade report to this report and that things weren't being misstated.

Q So you worked to confirm that things weren't being misstated relative to the Blade report?

A Right, yes.

Q You weren't concerned with whether or not the Blade report itself was consistent with the evidence or the facts that have been presented in other records in the proceeding?

A So I had very little time and very difficult -- and a lot of difficulty getting access to data that had been provided by SoCalGas. In fact, a lot of the files that I was trying to open, and to this day I can't open, they say that the files were corrupted; so I didn't have access to all of the response data that SoCalGas said they provided.

And the best I can do is with my technical knowledge in reviewing the Blade report and just validating in my own mind that what they were doing made sense, and I did review the daily reports with Boots & Coots and compared that to what Blade said had happened. And I just checked to make sure that

what was drafted in the opening testimony relative to the Blade report accurately reflected what Blade said.

Q And you were comfortable with that process?

A Well, it was the best I could do in the amount of time I had available. If I had had more time, I would have looked at all of the data and written my own report. But I didn't have that luxury.

Q When you were initially engaged, did you have an understanding of the timeline?

A I knew when the opening testimony was due. I knew they were hoping to get some testimony from me, but as the date drew closer, it was -- it was at least possible in my mind that I wouldn't be able to produce testimony in that period of time.

Q In part because of the technical difficulties with accessing records?

A And the fact that the contract wasn't signed; so, you know, the date when it was due wasn't changing, and I wasn't engaged yet. So there is only so much you can do in a couple of weeks' time.

Q So did you begin work prior to --

Did you begin substantive work in this case prior to execution of the contract?

A No.
Q So your concern with the delay in the execution of the contract was you understood that you had testimony due on a date certain --
A Right.
Q -- but that you weren't going to start looking at records until after the contract was done?
A Right.
Q So you wouldn't start substantive work or communicate with SED until after the contract was done?
A Exactly.
Q And did you understand at the time that you were engaged that there was already draft testimony that had been prepared?
A I think Darryl told me that they were working on a draft when he called me and the contract was signed; so before that, I didn't know that they were drafting anything.
Q And did he tell you or describe the scope of violations or issues that your testimony would be addressing?
And I don't mean the scope of work contractually. I mean the scope of issues that is in your testimony substantively.

A I'm sure we talked about that.
Q Okay. You indicated you didn't keep any notes, but in reviewing documents, you said mostly you read.
Did you mark up documents, underline, keep margin notes?
A Excuse me. Just a second.
I typically don't mark documents. I rarely highlight anymore. And sometimes I use sticky notes.
THE VIDEOGRAPHER: You've lost your microphone.
THE WITNESS: I'm sorry.
THE VIDEOGRAPHER: It's just off the clip there.
THE WITNESS: Sometimes I use sticky notes to mark pages.
BY MR. STODDARD:
Q In this case you used sticky notes to mark pages?
A Like a tab, you know?
Q Right.
A Yes.
Q And do you recall highlighting any documents in this?
A I don't believe there is any highlights in any documents.
Q Okay. And did you collect records that you

had marked with highlights or sticky notes and provide them to SED in connection with a request for work papers?

A Well, there weren't any highlights, and so a sticky note thing, I would just tab a page so I would go back to it, and I typically reuse those tabs so there wouldn't be any way to recover that as something to send to you.

Q What do you mean "reuse"?

You put them on the document and then you take them off the document?

A Yeah, I reuse them.

So I mark documents -- I mark pages that I want to go back and look at. Once I go back and look at it, I pull it off, put it in my sticky note pad and reuse it somewhere else.

Q So does your copy of the Blade report that is sitting at your home today have sticky notes on it?

A No. There is no sticky notes in my Blade report right now.

Q Do you think any of the documents that you have at your home in hard copy related to this investigation presently have sticky notes on them?

A They might presently, but they would be

1 documents that I didn't have prior to the filing of
2 the initial testimony.
3 Q Okay. We can take a break after -- just one
4 more question and then we can break for lunch.
5 The sticky notes that you use, are they like
6 this kind, Post-it notes?
7 A Yes.
8 Q Well, I wasn't sure if it was like that or a
9 blue kind, like a flag.
10 A No, I don't have the little blue kinds. I
11 only have yellow ones.
12 Q For the record, Ms. Felts indicated that she
13 uses the little Post-it notes.
14 Do you write on them?
15 A No, not often. I mean, if I wrote something
16 on it, it would be like a -- something that says
17 "Read this again."
18 Q Do you recall writing anything on any sticky
19 notes in this case prior to the service of your
20 opening testimony?
21 A No, I don't even think I used sticky notes
22 prior to the opening testimony.
23 Q Since service of the opening testimony?
24 A It's possible there is something written on
25 some note somewhere.

Q Okay. And aside from that, you haven't kept any other notes, handwritten, electronic --

A You're asking me --

Q -- or otherwise?

A -- prior to the opening testimony being filed?

Q Yes.

A You have everything I had, which is whatever Darryl sent you.

MR. STODDARD: Okay. Let's take a break for lunch. Come back at, let's say, 1:15. Let's make it 1:10 and we'll get started at 1:15.

MR. GRUEN: That sounds reasonable.

THE VIDEOGRAPHER: This is the end of disk number two, Volume Number 1, of the deposition of Margaret Felts on February 5th of the year 2020.

We are off the record at 12:15 p.m.

(Lunch recess.)

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SED SUR_REPLY_000932

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Investigation on the Commission's Own Motion into the Operations and Practices of Southern California Gas Company with Respect to the Aliso Canyon Storage Facility and the release of natural gas, and Order to Show Cause Why Southern California Gas Company Should Not Be Sanctioned for Allowing the Uncontrolled Release of Natural Gas from Its Aliso Canyon Storage Facility. (U904G).	)	I.19-06-016 (Filed 6-27-19)

DEPOSITION OF MARGARET C. FELTS
Los Angeles, California
Wednesday, February 5, 2020
AFTERNOON SESSION

Reported by:
LINDA RYAN
CSR No. 9915
JOB No. 311652

Los Angeles, California
Wednesday, February 5, 2020
1:24 p.m. - 8:39 p.m.

THE VIDEOGRAPHER: Here begins disk number three, Volume Number 1, of the deposition of Margaret Felts on February the 5th of the year 2020.

We are on the record at 1:24 p.m.

MR. GRUEN: I'm terribly sorry. Could we go off the record for just a moment, would that be okay?

MR. STODDARD: Yes.

THE VIDEOGRAPHER: Just a moment, please.

We are off the record at 1:24 p.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record at 1:24 p.m.

MR. GRUEN: While we were off the record we just had clarified that during the lunch break, Ms. Felts had refreshed her recollection as to her role regarding the item on her resume, entitled the "PG&E General Rate Case FERC Docket No. ER 16-2320-000," and she is prepared to make a statement for the record as to her role updating the information she provided this morning.

BY MR. STODDARD:

Q Okay. And for the sake of clarity, this relates to Exhibit 1-2; is that correct?
A Yes.
Q Go ahead.
A Okay. So on that case the only thing I did was help with some discovery and reviewed the responses to that discovery, and I believe I sat in on one interview.
Q And by "interview," do you mean deposition?
A It was actually something informal. It was not a deposition.
Q And you were retained as an consulting expert?
A Yes.
Q In what capacity? What was the scope of your work?
A It had to do with electric utility issues. And, honestly, without looking back at the file, I couldn't tell you exactly what it was that we were looking at.
I remember that I was doing discovery. I did not file testimony, did not write anything.
Q And your client was the California Public Utilities Commission?
A Yes.

Q And do you recall what the case concerned?
A So it was a rate case, so there must have been some subset of the rate case that they needed expertise on that I could provide; so I didn't -- I don't think I billed very much on that case.
Q What discovery questions do you recall preparing?
A None. I would have to look at a file to see.
Q Do you remember the general subject matter?
A No. I don't really remember too much about it.
Q Okay. But it didn't relate to natural gas storage facilities?
A It had nothing to do with natural gas.
Q Okay. And otherwise that entry is accurate on your resume?
A Yes.
Q Except for the spelling of legal office.
A Okay, I'll correct that.
Q All right. Thank you for that.
So I have another couple of questions I'd like to circle back on that relate to a few other topics that we covered prior to lunch.
And the first is we talked a little bit

about your work since you were engaged by SED prior to service of your opening testimony and who you spoke with or have spoken with related to your work preparing testimony for the Aliso Canyon matter.

You indicated you hadn't spoken with anybody at Blade, correct?

A That's correct.

Q And you indicated that you hadn't spoken with any other subcontractors, you know, working for SED or for you prior to service of your opening testimony, correct?

A That's correct.

Q Okay. Have you spoken with any other technical experts related to your work on this matter --

A No.

Q -- whether engaged by the Commission or not?

A No.

Q Have you spoken with anybody at SoCalGas about your work on this matter?

A No.

Q Have you spoken with anybody at SoCalGas about the Aliso Canyon incident generally?

A No.

Q Have you spoken with anybody at DOGGR about

the Aliso Canyon incident?
A No.
Q Have you spoken with anybody at the California Energy Commission about this incident?
A No.
Q The Governor's office?
A No.
Q State Legislature?
A No.
Q Okay. Thank you.
And to clarify, that was the California State Legislature. I know you're a resident of Colorado.
A I haven't spoken with anybody in either state.
Q Is your answer the same?
A Yes.
Q Have you spoken with anybody who is employed by the County of Los Angeles?
A No.
Q The Department of Public Health in Los Angeles?
A No.
Q Any federal authorities or public officials?
A No.

Q Okay. Any other government officials in any jurisdiction or any agency about the Aliso Canyon matter that you're aware of?

A No. I haven't actually talked to anyone about this case.

Q But --

What about prior to your engagement in this matter by SED, you know, understanding that it goes back a little ways, do you recall any significant discussions that may be relevant to your testimony?

A Nothing relevant to my testimony. At some point maybe a year ago I might have spoken with Darryl Gruen about the case coming up or that it may be it was already in the works. I'm not sure. But we were working on San Bruno; so I probably mentioned the case to him at some point in time that I would be interested in working on it.

Q Okay. So you reached out to Darryl to indicate an interest in helping out on the case?

A Yes. It was a long time before they actually called me and asked if I would do it, work on it.

Q Do you recall the contents of that communication --

A No.

Q -- what you said?
A I probably just said "Gee, Darryl, I'm a petroleum engineer in a former life, and I would be really interested in working on this Aliso case."
Q And how did Darryl respond?
A He probably told me they were handling it internally because I didn't hear back about it; so just, you know, a consultant reach out.
MR. STODDARD: Thank you.
I'd like to introduce Exhibit 1-8.
(Deposition Exhibit 1-8 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Ms. Felts, do you recognize this document?
A Yes.
Q This is a data request from Southern California Gas company to SED. And if you can refer to page 3, please, there is a single request.
Do you see that?
A Oh, right, yes.
Q It says "Identify the sponsoring witness(es) for SED's Opening Testimony."
A Yes.
Q Did you help prepare the response to this

question?

A No.

Q Did you review the response to this question?

A Not until after it was filed.

MR. MOSHFEGH: That's a different one.

MR. STODDARD: I'd like to introduce Exhibit 1-9.

(Deposition Exhibit 1-9 was marked for identification and is attached hereto.)

MR. STODDARD: I apologize, Ms. Felts. I'm going to restate one of my last questions because I realized you didn't have this document in front of you.

Q Just to confirm, my prior question is related to the data request from SoCalGas, which identified the question on page 3.

And also if you can please reference on page 2 of the SoCalGas data request paragraph 3 identifies a response deadline by close of business on December 6, 2019.

Do you see that? Paragraph 3 on page 2. It's the first at the top of the page.

A Okay, yes.

Q It has the deadline.
A I see that.
Q And it states the deadline is December 6, 2019, which was a few weeks after your testimony was served, correct?
A Yes.
Q Now, please refer to what we've marked Exhibit 1-9.
Do you recognize this document?
A Yes.
Q Did you help prepare this response?
A No.
Q Did you review this response?
A Not until after it was filed.
Q And this states that the sponsoring witness for SED's opening testimony is Ms. Margaret Felts; is that correct?
A Yes.
Q Did SED consult you about this before they served it?
A Well, they --
Q They filed it?
A They asked me to sponsor the testimony before it was filed, if that's what you're asking. The data response itself was handled, I assume, by

Darryl Gruen.

Q So why wasn't your name on the opening testimony that was served by SED?

A Well, since I didn't prepare the cover page, I can't answer that. It was filed by the PUC. I assume that might have been an oversight because I had agreed to sponsor it before it was filed.

Q Did you discuss the fact that your name wasn't on it?

A I didn't know until --

Q After the fact.

A I actually didn't know -- notice it until you just put it in front of me and said that it was empty, that it was blank. I don't even know if I ever had a printed copy of the cover. I might only have an email copy of the document.

Q So there was no discussion about whether they could identify you as their witness on the document prior to service?

A Well, there was discussion prior to service, and I agreed that I would sponsor it.

MR. STODDARD: Okay. I'm going to introduce Exhibit 1-9.

THE WITNESS: That's what I have in front of me.

MR. STODDARD: I apologize, I have to get these

Post-its off.

Exhibit 1-10.

(Deposition Exhibit 1-10 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Do you recognize this document?

A Yes, I've seen it before.

Q If you'll turn to page 3.

A Okay.

Q You'll see the first data request at the bottom is "Identify the date on which SED retained Margaret Felts in connection with the Proceeding."

Do you see that?

A Yes.

Q If you'll turn to page 4 on the back, question 2 is "Identify the date on which Margaret Felts agreed to adopt the entirety of SED's Opening Testimony."

Do you see that?

A Yes.

Q And Commission 3 requests your statement of qualifications.

Do you see that?

A Yes.

MR. STODDARD: I'm going to mark and introduce Exhibit 1-11.

(Deposition Exhibit 1-11 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Do you recognize this document?

A Yes.

Q Did you prepare this data response?

A No.

Q For purposes of the record, this is SED's data response to SoCalGas's data request for Exhibit 1-10.

And you see question 1, 2 and 3 from the prior data request restated there?

A Yes.

Q And SED's response was that SED contracted with Ms. Felts in connection with this proceeding on November 7, 2019, correct?

A That's correct.

Q And it states in response to question 2 that you agreed to adopt the entirety of SED's opening testimony on approximately November 17, 2019; is that correct?

A I think that's correct.

Q Which was approximately five days prior to service of your testimony, correct?
A Yes.
MR. STODDARD: I'd like to introduce Exhibit 1-12.
(Deposition Exhibit 1-12 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A Yes.
Q What is it?
A A report from the San Bruno case. It was the first one that was filed in March 12, 2012.
Q So this was your opening testimony in the San Bruno case?
A Yes.
Q In which PG&E was a defendant?
A Yes.
Q And it states on the cover document clearly that it is the report and testimony of Margaret Felts, correct?
A Yes.
Q Did you write this testimony?
A Yes.

Q Do you recall approximately when you were engaged by CPSD for purposes of preparing this testimony?

A Let me look at my resume. It's probably on there.

2011. I don't have the day, the day and month.

Looks like February 2011. It would have been sometime shortly after that.

Q February 2011?

A Sometime shortly after that because that's the date of the OII.

Q Okay. So approximately a year before your testimony was served?

A Yes.

Q And do you recall who your point of contact was at SED, then I think CPSD?

A Initially it was Bob Cagen.

Q "Bob Cagen."

And do you recall reviewing SED's investigation records for the purposes of preparing your testimony?

A In this case?

Q Uh-huh.

A No.

Q "No."
What generally do you recall in terms of your process related to preparing this testimony in this case? What did you review generally?
A Well, PG&E data that was submitted to the Commission.
Q So by "data" you mean records and documents?
A Yes.
Q Did you also review the NTSB report?
A Yes, I did.
Q Did you review an SED report?
A An SED report?
Q A report or document from SED related to their findings in this matter.
A I don't remember an SED report. There could have been one. There was a lot of -- a lot of records that I looked at.
Q And do you recall who your point of contact was at SED after Bob Cagen?
A Darryl Gruen.
Q And in this case did either Bob or Darryl hand you a prepared draft of this testimony when you --
A Of this testimony?
Q Yes.

A No. I actually prepared the entire thing.
Q So you prepared the entirety of this?
A Yes.
Q Based on your review of PG&E's records and data?
A Yes.
Q And based on the NTSB report?
A I probably referred to the NTSB report somewhere.
MR. STODDARD: Okay. Thank you.
1-13.
MR. MOSHFEGH: Yes, 13.
MR. STODDARD: I'm going to introduce and mark Exhibit 1-13.
(Deposition Exhibit 1-13 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A Yes.
Q What is it?
A This is the testimony I filed on behalf of UCAN in the SCG and SDG&E's Line 1600 Replacement case.
Q And if you'll turn to the Table of Contents,

which is on page 2, this provides kind of -- the Table of Contents for your testimony which includes prudent management of gas applied for safe operations demands, prudent engineering and various other subject matter areas that you cover in your subsequent testimony, correct?

MR. GRUEN: I'm just going to note an objection for the record.

To the extent this goes to the substance of the testimony, and it sounds like these questions are beginning to touch on substance, noting the objection at the outset that these are questions regarding a currently open proceeding to which SoCalGas and SDG&E are a party before the Commission.

And so the objection is that the -- any information that is elicited from Ms. Felts on this point, that it would be inappropriate to include that information in the record of that proceeding. And our understanding is that the information elicited is only for purposes for the notice of deposition in the Aliso Canyon proceeding.

And I would further notice that Ms. Felts -- that the attorney who is responsible representing UCAN, which -- and this testimony was prepared for UCAN -- UCAN's attorney is not present at the

deposition today.

MR. STODDARD: Your objection is noted again.

Q Ms. Felts, did you prepare this testimony?

A Yes.

Q Who was your point of contact at UCAN?

A Don --

I forget his last name.

Q Did anybody at UCAN hand you a draft of this testimony when you agreed to be their consultant and ask you to sponsor this?

A No.

MR. STODDARD: Thank you.

I'm going to introduce Exhibit 1-14.

(Deposition Exhibit 1-14 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q It's an email from Darryl Gruen to Margaret Felts sent on Sunday, November 17, 2019, copied on Karen Shea with the subject line "Re: Status of testimony Attorney Work Product - Confidential."

Was it your understanding that your work was protected by attorney-client privilege or attorney

work product privilege?

MR. GRUEN: I'm going to just note an objection that that doesn't characterize the complete document in that there is indeed a response from Darryl Gruen to Margaret Felts, but that the remainder of that email is, in fact, an email from Margaret Felts dated November 17, 2019 at 9:25 p.m.

MR. STODDARD: Okay.

Q Again, just to confirm, however, it's two emails; the top email is from Darryl Gruen sent on November 17th to you with a cc on Karen Shea. And the subject line is "Re: Status of Testimony Attorney Work Product - Confidential."

A Yes.

Q "Yes."

Was it your understanding that your work was protected by privilege during this period?

A No. I was advised early on when I -- when I received the contract that my communications would probably not be confidential and could be disclosed.

Q Did you put that subject line in there?

A I don't know if I put it on there or if Darryl put it on there.

Q Okay. Who advised you regarding your statement a moment ago that whatever you did in this

proceeding was likely not privileged and therefore could be disclosed?

A Darryl Gruen.

Q In your email below which was sent on November 17, 2019 at 9:25, you wrote "Over the weekend, I read all 1597 pages of the Well File provided by PG&E to SED."

I assume in that instance you meant SoCalGas?

A Right. On the brain.

Q "I did this because I figured it would be the best representation of the condition of SoCalGas's files," correct?

A Yes.

Q And then you state "The file actually included records for Wells SS-25, SS-25A and SS-25B," correct?

A Yes.

Q Did you access this file through the Diamond database we were discussing earlier?

A Yes.

Q So you were, in fact, reviewing an electronic production of records from SoCalGas's well file provided in response to a data request, not a physical well file, correct?

A Correct.
Q And you reviewed all 1,597 pages in the weekend as well as the data responses we discussed earlier and the Blade report prior to your submission of your testimony on November 22nd?
A Yes.
Q Did you also look at the data responses, the responses to Data Request 16, that same weekend?
A Yes.
Q Did you look at the underlying records produced in response to Data Request 16, a document production?
A I had a hard copy, I think, of the whole response. But I haven't verified that against the electronic response.
Q Do you recall receiving a privilege log in connection with the Data Request 16 response?
MR. GRUEN: I'm going to --
Just a clarification. If this is asking about testimony, if that's where this is going, if the witness could be referred to testimony, the testimony where the questions are going to be directed, I'll just note that.
MR. STODDARD: I'll refer to the email.
Q The last sentence of the email states

"I also looked at the responses to Data Request 16. These are records related to the well-kill efforts, so post October 2015."

And in connection with that, I am wondering what you reviewed and what you had related to Data Request 16, including --

Well, my last question, which is do you recall receiving a privilege log related to Data Request 16 and did you review it at that time?

A I don't really remember that there was a privilege log, but it could be bound in the front of that document.

So what I received was a bound document that was about this thick that was all DR 16. And it was Bates paged through it. I just don't -- I wouldn't spend any time looking at a privilege log if there was one at the front of it. It could have been there.

And the document contained a lot of copies of emails, a lot of duplicates of emails, and Boots & Coots daily records, not particularly well organized, and some -- I think some communications from Halliburton, maybe some technical records from them, like a proposal or something.

Q Okay. Do you recall there being

supplemental responses to Data Request 16 included in the material you reviewed?

A I don't think anything was labeled that way. I think it was just the actual documents that were bound in that volume.

Q Okay. In response to my question regarding whether you reviewed a privilege log associated with SED 16, you stated that "I just don't" -- "I wouldn't spend any time looking at a privilege log if there was one at the front of it."

Since then, have you reviewed a privilege log associated with SED 16?

A I may have looked at it in -- on -- in the database. Have not really given it any thought.

Q Okay. Have you reviewed any other version of the well file aside from the version that you describe in this email?

A I think I've seen at least two other versions in the response sets.

Q In SED's Diamond database?

A Yes.

Q Have you ever reviewed the well files in person?

A No.

Q Have you ever reviewed Blade's copy of the

well file?

A Not yet.

Q Is it your understanding that SED is in possession of Blade's version of the well file?

A I believe they have it. I haven't seen it yet.

MR. STODDARD: I'm going to note for purposes of the record that SED produced this document to us, but we didn't get a separate production of the initial email.

MR. GRUEN: I'm sorry, I can't --

MR. STODDARD: We got the response.

MR. GRUEN: I'm not clear when you say "this document," I'm not clear what --

MR. STODDARD: Referencing Exhibit 1-14.

MR. GRUEN: Okay.

MR. STODDARD: We received --

You produced this document to us, but if you'll see, as you pointed out, this is two separate emails.

MR. GRUEN: Right.

MR. STODDARD: And the bottom email, which includes -- which is the email from Margaret to SED, we don't have an independent version of that; so we aren't able to tell --

One of the reasons I asked about who added the "subject" line is we can't tell who made that designation based on this document and whether it was included with hers, because hers doesn't include the data at the top, including the subject line or any other data.

MR. GRUEN: Okay.

So for the record, the document does note "On November 17, 2019 at 9:25 p.m. Margaret Felts," and it has her email address, "wrote:" And then it provides the text that was being referred to and asked about.

MR. STODDARD: That's correct.

MR. GRUEN: I'm noting that just for the record.

And I think you're asking for us to produce that, just for the record.

MR. STODDARD: Yes.

MR. GRUEN: I think you're asking us to produce that email, the original email; am I tracking correctly?

MR. STODDARD: That's correct.

MR. GRUEN: Okay. We can do that.

Just for the record as well -- strike that.

We'll go ahead with that. That's fine. Thank you.

MR. STODDARD: All right. I'd like to mark Exhibit 1-15.

(Deposition Exhibit 1-15 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q And this is an email from you to Mr. Gruen dated November 18th. It's Monday, the day after the email that was marked Exhibit 1-14. And the subject line is "Confidential Attorney Work Product."

Do you see that?

A Yes.

Q Does this --

Did you add the "Confidential Attorney Work Product" subject line in this email?

A I could have added it, or I could have just replied to another email and added the text below. Sometimes I do that. I just pick out the latest email that Darryl sent and just reply, and use the same heading --

Q So you might --

A -- and send it.

Q So you might have deleted the other email in

this document?
A Yes.
Q Did you collect this document and provide this to Darryl for purposes of production to SoCalGas?
A I think Darryl probably sent it from his database, his email. I mean, produced it to you.
Q Okay. So do you commonly delete emails when you're replying in chains? Is that a typical practice or occasional?
A If I'm just looking for the latest email address for a person, that's what I do, I just pick one off of the most recent email and reply to it.
Q So in other words, if his email to you was on a different issue, you might --
A Yes.
Q -- delete that but use it for purposes of responding to him --
A Yes, that's correct.
Q -- or sending --
Ms. Felts, do you see where it says "Attachments: 2019 Draft Testimony"?
Do you see that?
A Yes.
Q You were sending Darryl a draft of your

testimony, correct?
A Yes.
Q Do you recall if this was the first draft that you sent him?
A I expect this was probably the first draft, and it was a draft of the part of the testimony related to records or recordkeeping.
MR. STODDARD: Okay. We're going to introduce Exhibit 1-16.
(Deposition Exhibit 1-16 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A Yes.
Q Is this the document that you previously referenced as your draft testimony regarding recordkeeping issues?
A I expect that's --
This is it, yes.
Q And when you prepared this testimony you had reviewed the version of the well file in the Diamond database?
A Yes.
Q Which again was an electronic document

production, correct?
A Yes.
MR. STODDARD: Thank you.
We're going to introduce Exhibit 1-17.
(Deposition Exhibit 1-17 was
marked for identification and is
attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document?
A Yes.
Q It's an email from Darryl Gruen sent on November 19th to you with copies on Amy Yip-Kikugawa, Nick Sher, and Karen Shea, correct?
A Yes.
Q And this was sent a day after you sent him your initial draft; is that correct?
A Yes.
Q And it included the subject line, "Attorney-client privilege confidential," with the proceeding number and SED Aliso testimony; is that correct?
A Yes.
Q Do you believe that this was a response to your email or one that originated from Darryl?
A I think it probably originated from Darryl.
Q And it identifies an attachment.

The file name is the proceeding number "SED Aliso Testimony.docx," correct?

A Yes.

Q And the subject line, and the contents says there is testimony attached?

A Yes.

MR. STODDARD: We're going to introduce Exhibit 1-18.

(Deposition Exhibit 1-18 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Do you recognize this document, Ms. Felts?

A Yes.

Q What is it?

A It looks like the draft testimony that Darryl sent me.

Q And to confirm, you did not write this testimony, correct?

A Let's see, it looks like this version does not include the part of the testimony that I wrote, which was the records section; so that's correct.

Q And the records section that you prepared would eventually be inserted at the end, is that correct, toward the end?

A I think it's before Section C.
Q Was this your first time --
MR. GRUEN: Just a clarification, to the extent that we're starting to creep into the actual questions about the testimony itself, so I just ask --
I'd reiterate just to the extent that the questions go there, if she could be directed to the part of the testimony where the questions are being asked.
MR. STODDARD: Understood.
THE WITNESS: Let's look at this.
Okay. So looking at Exhibit 1-7, it was inserted as Section 3 at the end of the testimony.
MR. STODDARD: Thank you.
Q Was this the first time you saw SED's testimony?
A Yes.
MR. GRUEN: And just clarification, when you say "was this the first time," what time?
MR. STODDARD: The date that she received this email, which was as established in Exhibit 1-17, Tuesday, November 9, 2019.
THE WITNESS: November 19th.
MR. STODDARD: November 19, 2019.

THE WITNESS: Okay.
BY MR. STODDARD:
Q And that day was the first day that you saw at 5:15 p.m. SED's draft testimony?
A Yes.
Q Do you know whether they were preparing it immediately prior to sending it to you, or whether it had been in existence for a while?
A I don't know.
Q And do you know who authored it?
A No.
Q What was your initial reaction?
A Well, it's not the type of report that I would write, but it was drawn strictly from the Blade report, and so I felt like --
I think it adequately represented what the Commission was -- or what SED was looking at for violations.
Q Why was it not the kind of report that you would write?
A Oh, I might have had done more research in the data and been able to add a little bit more depth to some of the discussion.
Q So it was a little bit thin?
A Yes.

Q Did you read it in its entirety when you received it?

A Yes.

Q Aside from your concerns about the lack of support, do you recall whether you agreed with all of the assertions?

A I had some concerns about some of them, one of them being the --

I think there is a statement that was carried over from Blade that said that there were no indications of a leak on -- ever on SS-25, and my review of the records in the well file suggested that there had been indications of leaks on the shoe on that well. And then I was -- I thought I had that turned off.

There was another area that I wasn't --

Oh, I wasn't real sure about issues related to bottom hole pressure, and so I went back and reviewed that more carefully in the Blade report and agreed with that. I think those were the main areas that I went back and looked at.

I felt like I had not read all of the supplemental reports for the Blade report at that time, but I did look at the areas -- the supplemental reports that supported the areas that I wanted to

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check on. And I did feel like Blade was very thorough in their investigation and felt like I could support the conclusions that were pulled over into this testimony.

Q Did you review all of the supplemental Blade reports --

Have you reviewed all of the supplemental Blade reports now?

A There is the last volume having to do with casings, whether it's some technical sessions of that that I haven't read yet, or actually I skimmed them, but I feel like I should go back and read them a little more closely.

Q When did you complete your first pass on the supplemental reports?

A Mid-January.

Q I'm going to direct you to page 36 of Exhibit 1-18. And you see there is a comment there from Darryl, and it's on the sentence that reads "External well-control specialists provide necessary experience and expertise; however, underground storage operators should also have personnel with the necessary skills to monitor and manage external specialists, a core skill for gas storage operator."

Do you see that?
A Yes.
Q And then the comment --
Mr. Gruen states "Margaret, do you have the expertise to say something along the lines of 'underground storage operators including SoCalGas should have personnel with the skills to do XYZ, even if they rely on third party well-control specialists such as Halliburton to do ABC. And multiple kill attempts demonstrate..?'"
Do you see that?
A Yes.
Q Did you discuss that comment with Mr. Gruen?
A I don't remember it, but I probably did.
Q Did you understand Darryl to be asking you to expand upon the highlighted sentence and provide further detail?
A No.
Q What did you understand Darryl to be asking?
A If I had the expertise to support a statement that he had written there or something like it.
Q Do you?
A As a petroleum engineer, I think I could say that SoCalGas should have somebody with that type of

experience, petroleum engineering, to oversee their subcontractors or their contractors.

Q And what type of experience is that?

A Some sort of reservoir engineering.

Q So --

A Or drilling or both.

Q So if they have --

If SoCalGas has somebody who is a reservoir engineer, a drilling engineer, then that would be sufficient?

A Yes. Yes, I think they do.

MR. STODDARD: All right. Thank you.

Let's see if I can get it right this time.

I'm going to introduce Exhibit 1-19.

(Deposition Exhibit 1-19 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q This is an email from Darryl Gruen to you on Wednesday, November 20th, 2019; so a day after he had transmitted the prior draft that we just discussed, and it is transmitting -- and it includes another attachment of -- with the same file name -- no, not

quite the same file name, strike that.

It includes an attachment entitled proceeding number "SED Aliso Testimony" with the date; is that correct?

A Yes.

Q And the content of the email reads "Aliso testimony attached. Darryl."

I'm going to introduce Exhibit 1-20.

(Deposition Exhibit 1-20 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q This is a revised draft that had been sent by Darryl Gruen on November 20th of the SED portion of the testimony. Please turn to page 37.

A Okay.

Q You'll note that the comment --

So it's slightly formatted differently because of a change in font size and some other formatting changes. But if you look up at the second sentence on the top of the page, that same sentence, "External well-control specialists provide," is there without the comment.

A Oh, yes.
MR. GRUEN: I'm sorry, I'm not tracking.
Is there a comment that is there? My copy, I don't see one.
MR. STODDARD: Sure.
Maybe it would be easier to compare with Exhibit 1-18, and reference, again, on Exhibit 1-18 page --
MR. GRUEN: Oh, I see.
MR. STODDARD: -- 36.
My point is this is the same sentence even though the pagination is different, the comment is gone.
Q Does this --
Do you recall now or does this suggest that you and Darryl had a conversation in the interim regarding his question about your expertise?
A All right. Let me look up -- it looks like the same statement.
Q Okay. Thank you.
Do you know why Mr. Gruen sent this version less than a day later after sending the initial draft?
A This draft has a recordkeeping section in it.

MR. GRUEN: I'm going to just note an objection that that --

Well, I'll strike the objection.

Go ahead.

BY MR. STODDARD:

Q Ms. Felts, can you direct me to the portion of the testimony that has the recordkeeping section in it?

A Okay. Well, you're right. It only has a heading for it on page 68.

Q Did you write that heading or did -- or did it appear in this draft or the prior draft?

A I expect someone else probably wrote it or maybe pulled it off of a draft I sent.

MR. STODDARD: Okay. Moving on.

Introducing Exhibit 1-21.

(Deposition Exhibit 1-21 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Ms. Felts, do you recognize this document?

A Yes.

Q This is an email from you to Darryl Gruen, no one is copied, and it was sent on Wednesday, November 20, 2019 and the subject line is "Edits to

Testimony." And you see in your response to Darryl where you state "Darryl, I can't get the tracking to work. It's possible it is showing on your computer, but I'm hesitant to put the work into it is doesn't show."

Would I be correct that that is supposed to read "but I'm hesitant to put the work into it if it doesn't show"?

A Yes.

Q The next sentence says "So I'm going to finish my testimony, and you can go ahead and use the SED testimony as is. I don't think I can sponsor it as written."

Do you see that?

A Yes.

Q Were you referring to the draft that Darryl sent the day before that we were just looking at, Exhibit 1-20?

A I don't know if I'm referring to that one or the one prior that you had provided. Things were going back and forth pretty quick.

And I know that I was having a problem doing the tracking on my computer, my PC, but I got that resolved eventually, and I believe I had some concerns that we may have just walked through over

the phone and resolved.

Q And do you recall what your concerns were?

A I think -- I think my main concern may have been the issue with the statements in the testimony that Well SS-25 had never exhibited a leak.

Q So over that single issue you were indicating in this email that you weren't going to sponsor it as written and suggesting that Darryl go ahead and use the SED testimony as is?

A It's possible. I'm usually pretty picky about those things, and that was a fairly inaccurate statement.

Q Were there discussions about what SED would do if you didn't sponsor the testimony?

A Yes.

Q And what was discussed?

A I -- I don't remember exactly, but I believe there was discussion of releasing it without a -- someone supporting it.

Q Releasing it without someone's name on it?

A Yes.

Q Was there any discussion of alternative witnesses?

A No.

Q So after you received this email, as far as

you recall, you think you spoke with Darryl on the phone?

A Well, to correct you, I sent this email. I didn't receive it.

Q I'm sorry, thank you for the correction.

A And I believe we probably discussed it over the phone.

MR. STODDARD: I'll introduce Exhibit 1-22.

(Deposition Exhibit 1-22 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q This is an email from --

Do you recognize this document?

A I don't really recall it, but it appears I wrote it.

Q It's from you to Darryl Gruen dated Wednesday, November 20, 2019, 7:39 p.m., and the subject line is "SED Testimony Cleaned and marked up versions."

Do you see that?

A Yes.

Q And it includes two attachments. One, it appears to be a clean version, and one that says "With Original Footnotes."

Do you see that?
A Yes.
Q You said "Still have to merge mine into this one."
And you are referring there to the documents -- the document testimony that you drafted?
A The records section.
Q "The records section"?
A Yes.
Q And this one you're referring to the testimony that was prepared by Mr. Gruen?
MR. GRUEN: I'm sorry. Objection to the characterization of the testimony calling testimony as "prepared by Mr. Gruen."
That assumes facts not in evidence, and it's a mischaracterization of Ms. Felts' testimony.
MR. STODDARD: Restating.
Q You were merging the section you prepared on records, you were going to merge that one into the version prepared by SED?
A Well, I don't know who prepared it, but it was provided to me by Darryl Gruen.
Q And the email reads "The Clean version has all changed except accepted footnote numbers adjusted. The other version shows all comments,

edits and retains all original footnotes. Margaret," correct?

A Yes.

MR. STODDARD: We might need to take a break for a moment.

No, we don't.

MR. GRUEN: Jack, we can continue this.

Potentially maybe this might be -- or assume might be a good time for a --

MR. STODDARD: Let's just take a quick break.

MR. GRUEN: Do you want to do that?

MR. STODDARD: Yeah, we've been going for another hour or so.

THE VIDEOGRAPHER: Just a moment, please.

We are off the record at 2:30 p.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record at 2:47 p.m.

MR. STODDARD: Okay. Picking up where we left off.

Just to circle back, we had just discussed Exhibit 1-22, which to recap included two attachments, which I'm now going to introduce.

The first we'll mark as Exhibit 1-23.

(Deposition Exhibit 1-23 was

marked for identification and is
attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document?
A Yes.
Q This is a first attachment to the email marked as Exhibit 1-22, and this is the clean version of SED's revised draft testimony which you revised, correct?
A Yes.
MR. STODDARD: Introduce Exhibit 1-24.
(Deposition Exhibit 1-24 was
marked for identification and is
attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A Yes.
Q And is this the redline version of the testimony that you revised combining SED's draft with your draft and which was --
I'm sorry.
A Go ahead.
Q -- which was attached to the email now marked as Exhibit 1-22.
Strike that. Correction.

This is your redline of SED's portion of the testimony. It does not include the records section, but this is the redlined version of what was attached to the email marked as Exhibit 1-22?

A Yes.

Q Thank you.

I'd like to note for purposes of the record that this document was missing from SED's initial document production, and we had to specifically request it and received it only two days prior to the deposition.

Turning to page 1 of the document, page 1 of the revised draft testimony, which is actually five pages into the document after the Table of Contents.

Do you see the redline through in the introduction where it states "Drawing on the Blade report and information obtained in its own investigation, this testimony identifies numerous safety (and health) violations of PUC Section 451 related to the uncontrolled release of hydrocarbon gas or methane for 111 days from Southern California Gas Company's (SoCalGas) Aliso Canyon Well SS-25 (SS-25 incident) including many different causes identified in the Blade Report from which the SS-25 incident resulted"?

Do you see that?
A Yes.
Q And that you struck the language "including many different causes identified in the Blade report from which the SS-25 resulted," is that correct?
A Yes.
Q Why did you strike that language?
A Probably because I thought it was redundant.
Q Okay. Please turn to page 11.
Do you see at the top where you deleted the discussion of groundwater as a source of corrosion?
A Yes.
Q And down at the bottom of the page 11 where there is a sentence regarding groundwater and microbes, "a form of Archaea caused the corrosion"?
A Yes.
Q And then below that is another sentence regarding MIC as the mechanism of corrosion; do you see that?
A Yes.
Q And that those sentences are all deleted in your redline; is that correct?
A Yes.
Q And why did you delete those sentences related to microbial -- Blade's findings of microbial

corrosion?

A Well, at the time I felt like the information that was drawn from the -- it was drawn primarily from the main report, and I had not read the details of their analysis, their lab analysis that showed how they came to that conclusion. And so I just wasn't real solid on supporting those statements at that time; so I deleted them.

Since then, I've looked at all of those reports and read the underlying investigation data, and I could have supported it had I had the time to look at those; so I think it was sound science.

Q Okay. Will you be amending your opening testimony to add those findings back in?

MR. GRUEN: I'm going to object to that in that it calls for attorney work product and attorney-client privilege.

That's a deliberation that is still being considered by SED.

BY MR. STODDARD:

Q Ms. Felts, these portions of the testimony that you -- of the draft testimony that you deleted related to microbial corrosion, did you put them back into the testimony that was served, do you recall?

A I don't remember.

Q Referring back to Exhibit 1-7. Please take a moment to review and just confirm whether you added any of that language back in.

MR. GRUEN: Just so I'm clear, the question is to compare page 11 of Exhibit 1-24 with comparable page on Exhibit 1-7?

Am I tracking correctly?

MR. STODDARD: I'm asking more generally whether --

I'm giving her time to flip through the relevant sections of the document to identify whether she understands -- or whether she added this language back into the document, not particularly page 11 of the document.

MR. GRUEN: I follow. Okay.

THE WITNESS: It doesn't look like I added it back in.

BY MR. STODDARD:

Q But now since the opening testimony, you've reviewed the relevant sections of the Blade report, and you're more comfortable with their conclusions on that issue; is that correct?

A Yes.

Q So would it be fair to say that at the time that you served your opening testimony, you hadn't

1 considered the entirety of the Blade report?
2 A Some of the technical supplements to the
3 Blade report were -- I had only glossed over, and so
4 I felt like I really needed to go back and look at
5 that in detail.
6 Q I'm going to direct you to page 42 of
7 Exhibit 1-24.
8 A Okay.
9 Q Same question here, do you see where it says
10 "Some of the 7-inch casing connections were seeping
11 gas at the outside of the casing and then the carbon
12 dioxide in the gas was likely a nutrient for the
13 methanogens," and you deleted this language, correct?
14 A Yes.
15 Q And separate from the reference of
16 methanogens, did you also doubt Blade's conclusions
17 regarding the 7-inch casing connections?
18 MR. GRUEN: I'm going to object to the
19 characterization of her testimony as doubting Blade's
20 conclusions.
21 The objection is that it's a
22 mischaracterization of her testimony thus far.
23 MR. STODDARD: All right, I'll restate it.
24 Q Ms. Felts, did you have similar concerns
25 related to those you had with respect to the section

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on MIC related to Blade's conclusions regarding the 7-inch casing connections?

MR. GRUEN: Same objection.

I think for clarification, she --

Well, I'll just note the same objection. It's concerns with the conclusions is a misstatement of testimony.

BY MR. STODDARD:

Q Ms. Felts, why did you strike that language that I referred to?

A Okay. So the statement is that there was seeping gas from a 7-inch casing which then fed or served as a nutrient to the microbial community that was causing the problem, so -- or causing the corrosion.

The main report lacked substantive support for that. And so it was necessary to go back and understand the tests that Blade ran on the 7-inch casing joints that showed or proved that there was leakage.

And so I needed to completely understand that part of the investigation to support that statement, and I -- had I really felt well about that, I would have also felt good about the seeping gas serving as a nutrient; so I deleted both sections

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just because I hadn't gotten to a sound understanding of what they had done that caused them to make that statement in the main report.

Q And now you feel comfortable having reviewed that section of the report that Blade's conclusions with respect to microbially influenced corrosion are well supported?

A I think they did a pretty good job of the review and the science.

MR. GRUEN: I'm sorry, she wasn't finished with her answer.

THE WITNESS: That's okay.

BY MR. STODDARD:

Q And that the --

And their conclusion that there may have been Archaea microbes?

A I really don't have an alternate opinion other than what they concluded on that. And they base that on their scientific research and knowledge; so I think it's probably a good conclusion.

There may be something else out there, but I'm not aware of it.

Q And you have faith in Blade's scientific process and conclusions?

A I do. I think they did a good job.

Q But you didn't speak with anybody at Blade or interview anyone at Blade, correct?
A No, I didn't.
Q Did you evaluate the credentials of the Blade personnel?
A I believe I did look at their credentials, and also I think I looked up some information about them online just to see what type of work they've done before, and it seemed like they had a fairly good history in the industry.
Q Did you review the description of Blade's sampling and microbial analysis protocols?
A Yes.
Q And you felt that those were sufficient and complied with standard procedure?
A I think so, based on my experience.
Q I'm going to direct to you page 20 of Exhibit 1-24.
A Okay.
Q Do you see the sentence in the second full paragraph where it says "The SS-25 temperature and noise logs had never shown an anomaly related to casing integrity"?
A Yes.
Q And is that your comment in the margin?

A Yes.
Q And the comment reads "I know this is a quote. However, you should know that temp and noise surveys on SS-25 showed one or more leaks from 1978 to 2012. But, these leaks were not shallow."
What was the basis for that comment?
A I had looked at the well file, and I was just reporting that there was something in the well file that showed that there were leaks.
Q And what was that something?
A Temperature surveys, primarily. I believe there is one or more noise surveys.
Q And you think --
You believe that both the temperature surveys and the noise logs showed leaks?
A There is no question that the temperature logs show leaks. The noise surveys seemed like they were inconclusive. Sometimes I think because they ran the noise logs under the wrong circumstances.
Q And this was based on your review of the electronically produced logs that were in SED's Diamond database?
A Yes.
Q And you disagreed with Blade on this point, correct?

A Yes.
Q Is it your understanding that Blade's investigation was conducted over a period of several years?
A Well, from 2015 to at least 2018.
Q And earlier you stated that you believed Blade did a very thorough job, correct?
A I think they did. I -- my -- I think --
And this is just my probably assumption is that they didn't have access to the same information I've had access to when they came to this conclusion. I don't know that for a fact. I just know they received some really late data from SoCalGas. And it's possible that they were basing their conclusions on DOGGR records, where they would not have seen this.
Q And, again, you did not review the records that Blade Collected or any of the productions and data responses that SoCalGas sent to Blade in connection with preparing your testimony, correct?
A That is correct.
Q Or in connection with this comment, correct?
A That's correct.
Q If Blade hadn't reviewed these records -- actually, strike that.

And these records, you found them in the well file that was available in the Diamond database, which included records related to SS-25, correct?

A Yes.

Q If Blade didn't review the records related to SS-25, do you believe that their investigation would be thorough?

A For what --

For the primary work that Blade was doing, I don't know if they needed the historical records. They needed the construction records; so they had what they needed from the Department of Oil and Gas records that were on file there.

This was just one area where for some reason they either were told or came to the conclusion that there was no -- had not been any prior leaks on that well. I don't --

There is no question in my mind that if they had looked at the records that I looked at, the temperature surveys, they wouldn't have said that; so I have to conclude they didn't see them.

Q And do you believe that the alleged fact of historic leaks is relevant to the alleged 451 violations in your testimony?

MR. GRUEN: I'm going to object that that calls

for legal conclusion.

I just am noting an objection for the record.

And more broadly just to the extent that there are questions that go to any violations in testimony that asks for a legal basis for violations, we're going to restate an objection. And we'll note discussion in the pre-hearing conference related to that.

But I wanted to note that objection for the record.

Having said that, she can answer the question.

THE WITNESS: Can you ask the question again?

BY MR. STODDARD:

Q Is your opinion regarding the presence of a historic leak dating back to 1978 at SS-25 relevant in your view to your alleged -- to the alleged violations of 451 in your testimony?

Let me restate that.

A Okay.

Q If there are no leak --

If there was no historic leak at SS-25, is that a mitigating factor in your view related to SoCalGas's O&M practices at SS-25?

A The reason for my concern in making the statement that there was no leak was just that it was an inaccurate fact in a report, and I'm a records person, so I like things to be accurate and based on records. And certainly since my testimony -- the written part of my testimony that went into this document had to do with recordkeeping, I was particularly sensitive to the fact that everything in this testimony should be accurate as it was recorded in records.

And in this particular case, the record file for SS-25 included a number of annual surveys that documented a leak at the bottom shoe of the well. And because this particular file excluded any analysis or memos about that ongoing leak, whereas other well files including 25A and 25B had that kind of -- those kind of notes in them, I felt like it was something that I should call attention to, at least among the PUC people.

It has, I think, little bearing on the -- the violations that were cited one way or the other.

Q Okay. You stated that you are a records person so you like to have things be accurate and based on records, correct?

A I like them to -- statements to accurately

reflect what is in the record.

Q And this statement, based on your review of records, you believed Blade was incorrect?

A Blade may have been correct on what they were looking at. It was incorrect based on the documents review I had done.

Q Did you endeavor to look at the underlying records on Blade's other findings in the Blade report?

A I think I considered everything that they made available. And certainly looked at -- looked at the testimony in light of the records that I had available to me, and this was the one that I had the most concern with.

Q Did you communicate to SED which records you thought would be necessary for purposes of being able to support the testimony, or was it simply accepting what SED gave you and limiting your review to that?

A I'm not sure I understand your question.

Q Let me take a specific example.

So you indicated, and correct me if I'm misstating you, but you indicated that you disagreed with Blade's conclusions regarding the -- their interpretation of the temperature logs or their statement regarding the historical noise logs at

SS-25. You disagreed with that based on your review of the records, correct?

A What I disagreed with was the statement the SS-25 temperature and noise logs had never shown an anomaly relating to casing integrity. That's the statement I disagree with.

Q And that was based on your review of records?

A Yes, which show anomalies relating to casing integrity; so the statement can't be correct. Now, it may not --

You said that I disagreed with Blade's interpretation of logs. I don't know that they had access to those logs.

Q Did that raise any doubts in your mind as to Blade's other findings or conclusions?

A No.

Q So taking an example on page 17 of Exhibit 1-24 regarding failure to implement a risk assessment program, it cites to the Blade report in the first sentence, "Corrosion was not detected on SS-25 because the 7-inch casing wall thickness on the SS-25 had never been inspected."

Did you verify that through inspection of records?

A There is no evidence of an inspection of the wall thickness in the SS-25 well file.

Q And with respect to Blade's identification of a failure to implement a risk management plan as a root cause, did you confirm their conclusion that it hadn't been implemented based on a review of records?

A Yes, there is no risk assessment program or any documentation of a risk assessment in the well file.

Q Did you look outside of the well file?

A We asked many -- in many different ways for risk assessments and have consistently been told that there are no records.

Q That's based on your review of which documents?

A Well --

Q You said "we asked."

Who are you referring to?

A I'm referring to SED in data requests.

Q And those are data requests that were made available to you through the Diamond database?

A I wrote some of those discovery questions, and the answers came back that there were none.

Q Turning back to the temperature logs.

What experience do you have with respect to

interpretation of temperature logs?

A I studied that in petroleum engineering, and other than that, none --

Nothing specific. It's not a fine science.

Q And could a temperature log be indicative --

Could a temperature log anomaly be indicative of something other than a leak?

A Well, I think maybe, but these -- these temperature logs in the SS-25 well file actually have notes on them that say "potential leak." It's pretty obvious, and the temperature survey, the numeric temperature survey printout shows a reduction in temperature, so --

And if you compare that well log or that well file and the temperature surveys in that well file to other well files at Aliso, you will see that a similar thing was happening at other wells, and there was responsiveness to it by SoCalGas.

For some reason not so on -- or it doesn't appear so in the well file for SS-25. It's not a one-time thing in this well. It was happening across Aliso.

Q You mentioned the temperature reading spike that would occur and indicate an anomaly --

A Actually a drop in temperature.

Q Right.
A Yes.
Q So the drop in the temperature that you can see on the temperature log --
A Yes.
Q -- correct, could that possibly be due to the presence of water behind the casing?
A Not likely at the shoe where this leak was occurring. It's very a common leak in these wells.
Q And do you recall what depth that was?
A Probably very close to the bottom, so it would be the bottom shoe.
So this well was about, I don't remember exactly, 8300 feet deep; so it would have been around that depth.
Q Okay. Direct you to page 28. Again, here same issue, statement regarding annual temperature and noise logs, and you deleted the clause that says "no anomalies were found," and included a comment that says "Wrong, we could replace the Blade footnote with SS-25 well file."
A Okay.
Q Again, you're disagreeing with Blade here.
Do you recall any other instances where you disagreed with Blade?

MR. GRUEN: I'm going to object. Asked and answered.

THE WITNESS: Well --

MR. GRUEN: She can answer the question, but it's been asked and answered before.

THE WITNESS: This is --

I mean, there might be other places in the testimony where I struck the thing having to do with the temperature survey, but I think that was -- that and the MIC issue were the two things.

BY MR. STODDARD:

Q I'm going to direct you to page 30, the sentence says "Kill operations where a fluid being pumped into a well while the gas is escaping at a high rate requires a detailed transient model to define the operational parameters."

And I apologize, I was reading that before you got to the page.

But do you see where I'm talking, it's highlighted?

A Uh-huh.

Q And you flagged it and said "Let's talk about this."

Do you know why you wanted to talk about it?

A I don't really remember. Something

triggered that thought. Possibly I might have wanted to talk about the bottom hole pressure.

Q What about bottom hole pressure?

A Just that that seemed to be -- let me back up.

Using the lower-than-actual bottom hole pressure might have been a problem for the kill operations. They couldn't wait -- or were not waiting there, the fluid they're pumping down the well to a heavy enough weight to overcome the reservoir pressure.

Q Again, Ms. Felts, you don't have any experience with well-control operations, correct?

A Well, not directly, but as an engineer I studied it, and it's not a -- it's not a fine science. It's just an engineering calculation.

Q An engineer with a suspended license, correct?

A I don't have a suspended license. Why do you say that?

Q I thought you indicated at the beginning of our deposition that your license was on hold.

A No, I have a general -- I have a general contracting license that's on hold, just has nothing to do with this.

Q So your engineering license is active?
A I don't have an engineering license --
Q Do you have any certification --
A -- in California.
Q In other jurisdictions?
A No.
Q But you have a general contractors license?
A Yes, that was --
Q And that's what has been put on hold?
A Well, I put it on hold. You can --
If you don't want to pay $500 a year for your general contracting license, you can pay $200 a year and then reactivate it when you have a contract; so that's what I did. It's still valid.
Q And is that related to work that you do on any energy facility context?
A Well, it's a general contracting license, and I used it for years doing drilling, monitoring wells and cleaning up hazardous waste sites. It has a HAZ rating with it.
Q Okay. Direct you to page 33. See the section --
I'm sorry, I'll let you get there.
A Okay.
Q Second full paragraph, second half, "It is

probable that continued pumping from the surface might have kept up with the fluid loss, but surface plumbing failures prevented the well from being kept filled."

Why did you delete that sentence?

A I think I deleted it because I didn't think it was necessary for the testimony.

Q Same question for the next sentence, "The use of fresh water and clear brine contributed to the attempt's failure because of fluid loss into the formation and loss of hydrostatic pressure, which allowed the well to flow after the kill attempt."

A Same point.

Q Refer you to page 46 and 47. There is a discussion here related to the chemical nature of groundwater.

A Yes.

Q And the sentence starts "Factors that control the chemical nature of the groundwater are mineralogy, transmissibility, and topography."

Why did you delete this paragraph?

A Here again, I thought this was too much detail and not contributing to the testimony.

Q Did you disagree with the substance?

A No.

Q Factual accuracy?
A No. I just thought it was drawing way too much detail into the testimony.
MR. STODDARD: I'm going to introduce Exhibit 1-25.
(Deposition Exhibit 1-25 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this email, Ms. Felts?
A Looks like it's an email from Darryl to me. I don't remember it.
Q It's the day before your testimony was served; is that correct?
A Yes.
Q And the email reads "Margaret, I'll call you about this shortly. Darryl." And it has an attachment titled "Recommended Fixes."
A Okay.
MR. STODDARD: I'm going to mark Exhibit 1-26.
(Deposition Exhibit 1-26 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?

A Not really.
Q This was the attachment to Exhibit 1-25, which was Darryl's email to you with the attachment "Recommended Fixes," and Darryl said he was going to call you about it.
Do you recall Darryl calling you about it?
A No, but ask questions if you want.
Q Okay. Do you know if this document was incorporated into your testimony?
A I don't recognize it. Do you know where it is in the testimony?
Q I'll refer you to Exhibit 1-7.
A I have that here.
Q Turn to page 77. 76.
A Okay.
Q Does this refresh your recollection?
A Okay. I see where it is. I understand what it is. Okay.
Q Okay. I take it you didn't write this section, correct?
A No.
Q And it doesn't sound like you reviewed this section either, correct?
A I'm sure I read it because I read the whole testimony before it went out.

Q But you don't recall discussing it with Mr. Gruen?

A Well, we probably discussed it because we went over all of this before it went out. But looks a little --

Let me see.

Okay. We probably just walked through it toward the end.

Q Okay. So you don't recall feeling uncomfortable about the fact that Mr. Gruen sent you a new section of your testimony that you were agreeing to sponsor the day before you were due to serve it?

A Well, I think this was something that was probably already being discussed, and it just got finalized here.

Q Discussed with you?

A Yeah.

Q But you don't recall?

A Well, I don't recall this format of it. I guess this is how it looked when it was printed out from the email. This looks more familiar, what is in the testimony. It's just a formatting thing I see.

Q Looking at the one in the final testimony --

A Okay.

Q -- starting at page 26.
A Okay.
Q Do you recall --
A 76 or 26?
Q I'm sorry, 76. Thank you.
A Okay. Okay.
Q Do you recall discussing "Solution 1, Production casing should be cemented to the surface" --
A Yes.
Q -- with Mr. Gruen?
A Yes. This is --
That was a common finding, yes.
Q And do you recall doing any research or investigation on this recommendation?
A Well, I'm sure it came right out of the Blade report.
Q So for purposes of this, you are relying on the Blade report and you're satisfied with their findings on this issue?
A For purposes of almost the whole report, I was relying on Blade, and I felt pretty comfortable with it. We just went over the areas that I wasn't comfortable with.
MR. STODDARD: Okay. Thank you.

I'm going to introduce Exhibit 1-27.
(Deposition Exhibit 1-27 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A Yes.
Q And this is an email from Darryl to you --
A Yes.
Q -- marked "Attorney-client privilege," attaching a revised or a -- I'm sorry, with an attachment titled "Felts.2019 Draft Testimony 112119," correct?
A Yes.
MR. STODDARD: Introduce Exhibit 1-28.
(Deposition Exhibit 1-28 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A This looks like the recordkeeping section.
Q Is this Darryl's revisions to the initial draft recordkeeping section that you sent him?
MR. GRUEN: Objection. Calls for speculation, assumes facts not in evidence.

BY MR. STODDARD:

Q Is this a revised version of the draft that you initially sent to Darryl?

A It looks like there is a couple of comments on it, all for me to confirm footnotes.

Q Do you see the comment on page -- the pages are not numbered, the second-to-last page of the document?

A Yes.

Q Is that a comment from Darryl?

A In the red -- little red box?

Q Yes.

A Yes.

It says "Margaret to confirm accuracy of footnote."

Is that the one you're looking at?

Q Yes.

And you believe that's a comment from Darryl?

A I think so. It says "GD1." That's his initials and number 1.

Q Referring back to Exhibit 1-16 --

A 1-16.

Q -- for comparison purposes --

A 1-16. I don't seem to have it. There

should be one in this stack.

THE VIDEOGRAPHER: Counsel, while she is looking, may I have a moment to change my disks?

MR. STODDARD: Yes.

THE WITNESS: I got it.

THE VIDEOGRAPHER: This is the end of disk number three, Volume Number 1, in the deposition of Margaret Felts on February 5th of the year 2020.

We are off the record at 3:39 p.m.

(Off the record.)

THE VIDEOGRAPHER: This is the beginning of disk number four, Volume number 1, of the deposition of Margaret Felts on February 5th of the year 2020.

We are on the record at 3:44 p.m.

MR. STODDARD: Thank you.

Q Referring back to where we were, we were comparing documents 1-16 with 1-28.

And for sake of context, 1-28 is a later version of the same document as 1-16, except that 1-28 was sent from Mr. Gruen to Ms. Felts the day before her testimony was filed -- the day before her testimony was served.

I'm going to direct you to page 2 of both documents at the bottom.

A Okay.

Q Do you see the sentence starting "The significance"?
A Yes.
Q "The significance of these files" --
In the older document it states "The significance of these files is that they contain records not included in the SS-25 Well File but relevant to the operation, maintenance and closure of Well SS-25 because these wells share similar design," and it goes on.
In the more recent version that Darryl sent to you on the 21st, it states "The significance of these files is they contain record types such as Interoffice Memos, handwritten field notes, analyses, and reports that are not included."
That's a change relative to your original draft; would you agree?
A Yes.
Q Did you make that change or did Darryl make that change?
A I think I made --
MR. GRUEN: Objection. Calls for speculation as to the actions of Darryl Gruen.
BY MR. STODDARD:
Q Did you make that change?

A I made the change orally to Darryl.
Q So you had a phone call to discuss the prior draft?
A Yes.
Q Do you believe that all changes in this document were made by you pursuant to that phone call?
A Well, there is one on the front page that I know was, and that was where we deleted a paragraph I wrote about 451 and slightly modified the first paragraph, I think, so --
And in this one I know, because Darryl wouldn't know about interoffice memos, handwritten field notes and analyses and reports. I had to have said that.
Q Why wouldn't Darryl know about that?
A Because he hasn't read that well file, I don't think.
Q And how about looking at the footnotes on page 2?
A Footnotes on page 2?
Q Yeah.
MR. GRUEN: Of which exhibit?
MR. STODDARD: I'm sorry, of Exhibit 1-28.
THE WITNESS: Okay.

BY MR. STODDARD:

Q They did not appear in Exhibit 1-16, correct?

A Okay. That's true, but I would have -- I would have told him what the footnotes had to be. He wouldn't have known.

Q Okay. And do you believe that's likely the case?

Do you recall the conversation you had with Darryl about these changes?

A Yeah.

Q Do you think all of the changes were probably made pursuant to --

A Yes.

Q -- your discussion?

A Uh-huh.

Q I'm going to direct you to the first page of Exhibit 1-28.

A Yes.

Q The second footnote related to Public Resources Code Sections 3106, 3180, 3181, 3220 and 3403.5.

Did Darryl also make that change at your direction?

A No. I would guess he probably actually put

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the code sections in there because that's related to, see footnote 2, so we probably looked at it while we were on the phone, and he probably put it in.

Q But you're not sure?

A I'd have to look up the code and tell you for sure. But if it's -- if it's DOGGR codes, then I put it in. If it's PUC codes, he put it in.

Q Okay. So it might be helpful for purposes of the record actually then to introduce them so you can confirm based on the subject matter.

A Okay. That would be helpful.

MR. STODDARD: We'll mark this as Exhibit 1-29.

(Deposition Exhibit 1-29 was marked for identification and is attached hereto.)

MR. STODDARD: I apologize the first page is Section 3008, which you don't cite to; its just definitional. It's just definitional the first page, that's 3008.

THE WITNESS: Right.

BY MR. STODDARD:

Q That is not something that you cite. But if you turn to page 2, it's Section 3106, take a moment to review it.

MR. GRUEN: I'm sorry, just for the record, it

appears as if there are multiple page 2's in the document; so just to --

Could we clarify which page 2 is being referred to for the record?

MR. STODDARD: Yeah.

So to clarify what has been marked as Exhibit 1-29 is California Public Resources Code Sections 3008, 3106, 3180, 3181, 3315 and 3320, 3316.2 and 3403.5, and I -- they are stapled together.

And I was directing the witness to the second page of the packet, which is Section 3106.

MR. GRUEN: Understood. Thank you.

THE WITNESS: Okay.

BY MR. STODDARD:

Q So you've reviewed the document.

Having done so, did you add these citations?

A I would have added them.

MR. STODDARD: Okay. Thank you.

We can take a break if it's okay with you.

MR. GRUEN: Okay.

THE VIDEOGRAPHER: We are off the record at 3:52 p.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record at

4:25 p.m.
BY MR. STODDARD:
Q Ms. Felts, I'm going to reference with the next questions Exhibit 1-7 --
A I got it.
Q -- which is your opening testimony that was served.
A Okay.
Q Turning to pages 3 through 6 of this document.
A 3 through 6?
Okay.
Q Do you see violations starting at number 95 and going through 320?
These are violations that relate to SoCalGas's assertions of attorney-client or attorney work product privilege; is that correct?
A Lack of cooperation, is that what we're talking about? Am I looking at the wrong thing?
Q Yes, 95 to 320, "Lack of Cooperation."
A 320, yes.
Q And for each of these --
If you want to take a moment to review, you can, but for each of these, it relates to SoCalGas's privilege claims?

A Okay.
Q And that's the majority of the violations that are asserted in your testimony, do you agree?
A Numerically, yes.
Is that what you're talking about, "the majority"?
Q Yeah, the majority.
A Yeah, okay.
Q Yeah. All right. Now, turning to Section 2, C.2 that is referenced in association with these violations.
A And page?
Q I'll have that for you in a second. 52.
A 2, I see 2 on page 52.
Q Yeah.
And earlier you stated that you did not draft this section, correct?
A Yes.
Q And that is everything related to the privilege issues, correct?
A Yes.
Q But you are sponsoring this portion of testimony, correct?
A Yes, I agreed to sponsor the entire testimony.

Q How did you get comfortable to sponsor this section?

A Well, I guess I went over these particular violations with -- with Darryl and discussed them with him.

Q When did you do that?

A It would have been prior to the testimony going out.

Q And you feel that you have a good understanding of the underlying facts related to this issue?

A Well, I think I have a pretty good understanding of what was happening.

Q Did you review any underlying documents associated with these violations?

A I reviewed the documents that were attached, the exhibits.

Q Do you recall any specifically?

A Not without looking at them. I should remember them. I think I just looked at them yesterday.

Q But earlier it does not include the privilege log associated with SED 16, correct?

A There was a point in time when I looked at the privilege log. I just can't really answer any

questions about it unless you show it to me.

Q Do you recall reviewing any of the documents that SoCalGas withdrew its privilege claims -- for which -- let me restate that.

Do you recall reviewing any of the documents that are the basis for the alleged violations?

A These are the documents.

Q Related to the privilege issues?

A The documents that you eventually produced --

Q Correct.

A -- I'm pretty sure I saw them. I don't --

It seems like I remember emails, but I'm not --

I mean, I can't tell you the content of them just as I sit here today.

Q Do you recall reviewing any correspondence or letters between SoCalGas and SED related to meet-and-confer meetings --

A No.

Q -- on the privilege issue?

A Not specifically.

Q Do you recall reviewing any data responses related to the privilege issues from SoCalGas?

A I think I probably did. If you want to ask

specific questions, you're probably going to have to show me the documents.

Q And do you feel as though you understand SoCalGas's position with respect to its initial privilege assertions relative to the privilege -- relative to the documents that are at issue in the privilege log?

MR. GRUEN: Jack, if I may, I think there is a --

I'm going to object to the question as vague in that if there is a particular area in the testimony that you want to direct -- or documents, the witness has called for documents that you can use to ask questions.

But the vagueness in this question is the actual position.

Without identifying the piece of testimony or the document where it's stated, it's going to be hard for the witness to answer a question like that.

MR. STODDARD: Understood.

I'm trying to understand the witness's process with respect to sponsoring this testimony; so I'll restate the question.

Q Just as a matter of fact, did you consider SoCalGas's position with respect to the privilege

issue in evaluating the testimony that you were provided by Mr. Gruen?

A Are you asking me if I understood why SoCalGas was claiming privilege?

Q Yes.

A I think I -- I think I understood what SoCalGas said was their purpose in claiming privilege. That's probably not the same as saying that I understood it. I --

MR. STODDARD: Offer this as exhibit.

(Deposition Exhibit 1-30 was marked for identification and is attached hereto.)

MR. STODDARD: Take a moment to review that document.

MR. GRUEN: Just, Jack, just for clarification, you want her to review the entirety of this document?

MR. STODDARD: No. I want her to review it to the extent she is --

If you need additional time, just ask for it. If I ask a question, we can see --

THE WITNESS: Why don't you ask a question and see how far we can go with it?

BY MR. STODDARD:

Q Okay. Do you recognize this document?

A I've seen it.
Q Did you review it in connection with preparation of your testimony?
A No, I did not have it until after then.
Q Okay. Thank you.
Ms. Felts, I'm going to direct you to page 62 of Exhibit 1-7.
A Okay.
Q Middle of the page, do you see where it starts "By SED's count, approximately 18 additional documents were released"?
A Yes.
Q And then it says "Each of the 95 pages that SoCalGas did not release on the grounds of attorney-client or attorney work product privilege is a Section 451 violation because it delayed SED's ability to get this information as part of its pre-formal investigation."
Do you see that?
A Yes.
Q Are you aware of any specific information in the 95 pages that you believe was important to SED's investigation?
MR. GRUEN: Objection. Mischaracterizes the use of the term "investigation" as -- in the past tense

mischaracterizes it.

The investigation is ongoing.

THE WITNESS: The way I could answer that is that apparently this, in part, relates to the DR 16 response. And if portions of the DR 16 response were not available, it would be difficult to nail down some of these violations. But since I don't know which pages specifically out of that response were withheld, I can't answer.

BY MR. STODDARD:

Q Well, I'm asking, Ms. Felts, what this information in your testimony is referencing because there is no citation, so I'm not sure.

But it says "Each of the 95 pages that SoCalGas did not release on the grounds of attorney-client or attorney work product privilege is a Section 451 violation because it delayed SED's ability to get this information as part of its pre-formal investigation," and I'm asking what that information was in your view?

A I think this information refers to the 95 pages that SoCalGas did not release.

Q Do the contents of those 95 pages matter in your view as to whether or not it's a Section 451 violation?

A I don't think it's the contents that is the issue here. I think it's the release of the documents that were requested. So it goes to the investigation overall.

If you don't know what is in the records, you have to assume that it's possibly not safe -- a condition or relevant to a condition that is not safe; so it prohibits the complete investigation by not being able to look at the records.

Q That's not what this sentence says though.

It says that SoCalGas did not -- that "Each of the 95 pages that SoCalGas did not release on the grounds of attorney-client or work product privilege is a violation because it delayed SED's ability to get this information as part of its pre-formal investigation" seems to be suggesting that there was information in there which was material to the investigation that SED was prevented from getting.

Would you agree?

A And I think that's the assumption that they made when they didn't get it.

So it's made prior to receiving the 95 pages. You can't make a judgment on the content of something that you haven't received yet; so it's the delay that is the problem.

Q Are you --

Is it the case, then, that you believe that SED did not receive these pages at the time that these violations were asserted?

A I'm actually not sure when the pages were turned over.

Q Okay. Above that, do you see the sentence that says "By SED's count, approximately 18 additional documents were released"?

A Yes.

Q And there are violations both for those 18 documents and the 95 pages; is that correct?

A I think that's correct.

Q Can you explain why in one instance the violations are linked to documents and in the other it's pages?

A That's --

I don't know. That was a choice of wording, I suppose. Maybe somebody counted up the pages in the 95 number.

Without having the 18 documents in front of me, I can't tell you whether that's 18 individual documents, therefore 18 pages, or 18 multiple-page documents.

Q In general, discovery requests are for

1 documents, not for pages, would you agree?
2 A Yes.
3 Q Do you think it would be more reasonable to
4 assert violations based on documents that were
5 withheld versus documents that happen to have
6 multiple pages that were withheld?
7 A I don't really have any history on that as
8 far as the way violations are counted.
9 Q But you are sponsoring this testimony,
10 correct?
11 A Yes.
12 Q So why in your view should violations be
13 calculated on the basis of individual pages for
14 multipage documents?
15 MR. GRUEN: I'm going to object.
16 This line is calling for legal conclusion as
17 to how violations are counted. This is a legal
18 question that is appropriate for briefing, not
19 questioning of the witness.
20 She can answer if she wants to, but this
21 is -- in SED's view this is a waste of time.
22 THE WITNESS: Without looking at both sets, the
23 18 and the 95, I don't know why it was chosen to call
24 one documents and one pages, but I would expect that
25 the 95 pages is probably 95 documents; so other than

that, I think -- I think it should be consistent. It's probably my fault for not checking it.

MR. STODDARD: Thank you.

Q In the set that you did review, do you recall noticing any duplicate documents? Again, this is related to the --

A Privilege.

Q -- the privilege, the 95 or the 18.

A I don't recall offhand, but duplicates are very common in SoCalGas responses. Certainly in DR 16 there were duplicates upon duplicates of emails.

Q And if there were duplicates of documents in this data set, would that change your assessment as to whether or not it should be a violation?

A If the duplicates should be a violation?

Q If the withholding of the duplicate for basis of privilege should have been a violation of 451 and Rule 1.1?

A Well, I think you're making the assumption, again, that the -- I could assess the delay of producing things I don't know what they are, you know, ahead of time because I wouldn't have known that there were duplicates in that set.

All I know from a privilege log is that

you're claiming privilege for X number of documents, and you probably had a page count on them in the log, but --

So you claim the privilege -- or SoCalGas did then. That took a certain amount of time to get the documents, and that's the delay, and that's the basis of the assessed penalty.

Q Okay. Turning back to the beginning of Exhibit 1-7 --

Actually, set that aside for a second. I'm going to ask some other questions without referencing a document.

Ms. Felts, what experience do you have with -- what prior experience do you have with root cause analysis investigations?

A I've only reviewed root cause analysis. Mostly related to pipeline cases.

Q How many root cause analyses have you reviewed?

A I don't have an exact count, but I'd say probably at least over 50.

Q And you said mostly related to pipeline cases; is that correct?

A Yes.

Q Do you recall any that were related to gas

storage fields?
A No.
Q Are you familiar with the phrase "technical root cause analysis" as opposed to root cause analysis?
A I wouldn't know the difference if there is -- if there is a difference.
Q So no?
A Not in the field as it would apply to this type of incident.
Q And you say you've reviewed over 50 root cause analyses; is that correct?
A Yes.
Q Have you ever prepared a root cause analysis?
A No.
Q Or been on a team that was preparing a root cause analysis?
A No.
Q Have you overseen preparation of a root cause analysis?
A It's possible that at the refinery and at Celanese I was involved in overseeing root cause analysis on some incidents.
Q Prior to this matter, what was the most

recent root cause analysis that you can recall reviewing or being involved in?

A In the San Bruno case I reviewed all of the historical analyses that were provided, and there was a whole archive of them at PG&E.

Q Was that root cause analysis prepared by the NTSB; is that correct?

A No. These would have been either in-house by PG&E or by external third-party contractors and -- for PG&E.

Q And in your experience how do those prior root cause analyses compare to the Blade report in terms of volume and length?

A It was quite a variation depending on the incident and probably the significance of the outcome of the incident. But I would say overall the Blade analysis was far more extensive and detailed, but the engineering or technical analysis of the pipe itself is very similar.

Q So the metallurgical piece?

A Yes.

Q And in reviews of other root cause analyses that you've done, have you looked only at the report, or do you also look at underlying data, information, that was collected by the investigator in the course

of preparing a root cause analysis?

A I've generally had access to all of the data and underlying records, assuming they're available. Sometimes if you're going really back in history, all you get is the report. But most of a metallurgical analysis would have lab reports attached to them and photographs and basic information that the report relied on.

Q And in this instance have you been offered access to review that information for the Blade report?

A I would say that a lot of it is in the supplemental technical reports that were provided in the additional volumes.

Q But beyond the supplemental reports, the actual data they collected or, you know, images that they didn't include in the report ---

A I haven't reviewed anything outside of what they provided.

Q What is your understanding of the purpose of a root cause analysis investigation?

A Generally?

Q Generally.

A To determine what the cause of an incident was or a failure, pipeline failure, a well failure.

Sometimes it's an operational issue that caused a problem; so it's generally to determine what the cause is of an incident.

Q So that you can prevent similar incidents from occurring in the future; would you agree?

A Well, that's a good start. If you can figure out what caused it, then you can figure out how to prevent it in the future.

Q But would you agree that that's one of the purposes of a root cause analysis is to identify the causes in order to prevent similar -- in order to prevent reoccurrence of similar events?

A It's one.

Q And would you agree that a root cause analysis investigator should include all potential causes?

A Well, I mean, if they did a really good root cause analysis, they should be able to determine what the cause was, not a range of causes.

Q In conducting their investigation though, when they're considering potential causes for purposes of scoping their investigation, would you agree that they should include all potential causes, or do you think they should circumscribe it?

A I would think a good engineering review

would include a range of possibilities at the front end, and then you would start eliminating them pretty fast because you would want to focus in on where the data is leading.

Q And that the root cause analysis investigator should follow the data toward what they identify as a root cause?

A I think so.

Q Regardless of whether or not that root cause relates to something that is required by law?

A I don't think required by law has much to do with a root cause analysis.

Q Regulation?

A Same thing. I mean, whether it's required or -- a required activity or not, the cause is still going to be technical, unless you're looking at an operational issue, if somebody did or did not do what they were required to do and caused an accident, say.

Root cause analysis could be performed on a lot of different kinds of incidents, like car accidents, you know, and purposes can range too. A lot of them are called for by insurance companies. They just want to know where to assign liability. They don't care whether it gets fixed.

Q Referring back to Exhibit 1-7 --

A Okay.
Q -- direct you to pages 7, 7 to 9.
MR. GRUEN: I'm sorry, 7 and 9?
MR. STODDARD: 7 through 9.
MR. GRUEN: 7 through 9.
BY MR. STODDARD:
Q Starting with page 7. This identifies "A root cause for the SS-25 incident was the lack of detailed follow-up investigation, failure analyses, or RCA of casing leaks, parted casings, or other failure events in the field in the past."
Do you see that?
A Yes.
Q "There have been over 60 casing leaks at Aliso Canyon before the SS-25 incident, but no failure investigations were ever conducted."
A Yes.
Q Do you contend that a root cause analysis should have been performed for all 60 casing leaks?
A Well, I would say that it would not be possible to do a root cause analysis in the manner that Blade did because you would have to take the well out of service and pull all of the casing; so that wouldn't be practical.
On the other hand, I think there were things

that SoCalGas could have done to determine the cause of failures, not just that a failure occurred, which seems to be what was typically happening. They could have determined causes using available technologies, and they didn't --

As near as I know, as I can tell they did not, at least not until I saw some study in 2014 on I think it's Well FREW2 that actually went to determining the cause of the corrosion, but -- and maybe that one actually wouldn't be considered a root cause analysis. But certainly it was closer.

In most of the well files that I have looked at, I don't see any evidence of an effort to determine cause.

Q You mentioned tools that can be used while the well remains in service to determine cause?

A Yes.

Q Can you identify some of those tools?

A Oh, I think we did that in a data response. But there are tools that can be run into a well while it's killed temporarily in order to measure the thickness of the well casing or a tubing thickness. There are other kinds of logs that can be run that would give you a sense of erosion or conditions of the wells.

So I think you have to pick the right log technique and contractor and collect the data and see what you can find out about the well.

Q So had SoCalGas, after identifying a failure, run casing inspection logs, in your view that would have been sufficient for purposes of identifying cause in a failure investigation?

A No. I think once they had determined, say, that there was -- there were a number of failures, say, in the same area -- either depth of wells or across a geologic formation, like sand with water in it has corrosion in a number of wells exposed to that sand, maybe the casings are all, you know, not cemented. If there are similarities across the wells, then I think they should maybe take one of those wells out of service and do a more extensive study.

Q But the question related to a specific well failure in terms of what an investigation would be for a specific failure, so taking one in isolation.

MR. GRUEN: I note an objection for the record.

It is not Safety and Enforcement Division's role to identify the kinds of investigations that Southern California Gas Company should be doing on its own field. That is the role of the operator and

it's -- the --

This goes beyond -- generally speaking, this goes beyond the scope of the testimony to ask questions prompting your witness, Ms. Felts, to identify how SoCalGas should be investigating its field.

So she can answer the question, but we're noting the objection for the record and -- on this question and others to which SoCalGas asks how it should be investigating its fields, including leaks in this one.

MR. STODDARD: Noted.

Q So to repeat my question, for purposes of a specific casing leak --

So earlier you talked about kind of a more regional type of potential investigation. I'm focusing in on what would have been adequate investigation for a particular casing leak.

After a leak is identified or there is a condition or a failure, had SoCalGas run a casing inspection log after killing the well, would that have been sufficient for purposes of identifying the cause?

A Probably not. There is probably going to have to be some additional information, but I can't

tell you exactly what it would be. And I would guess that if it were my well, and I wanted to find out the cause, I would probably call Halliburton or one of their competitors and say "What is your latest technology? How can we figure out what the cause of this failure is?" And they would be happy to charge me a lot of money and come tell me how to do that.

Q But you wouldn't kill the well, cut the casing and do a full-blown RCA?

A Well, it depends. Because I think actually SoCalGas did kill wells and look at casing in some instances. I'm not sure that they generated any reports that said what caused the failure in the well.

But if you have a low-producing well, it's not useful in the management of the field anymore and it's in a location -- it failed and it's in a location where it would provide useful information, there might be a good reason to take it out of service completely and remove some casing to find out what caused the problem. Because it could provide vital information for the rest of your wells that are operating well right now but might not be later.

It's an engineering decision that would have to be made by SoCalGas's reservoir engineers.

Q But to restate the point that you made earlier, an RCA for each and every failure would not be practical, correct?

A An RCA, to the extent that Blade did this one for SS-25, is not practical. It's not field practical for an operating field.

Q Okay. Direct you to page 3, 4, 5 and 6. This is the "Table 1: Summary of Violations," and this is in Exhibit 1-7.

A Okay.

Q Do you see the columns in this table titled "Begin Date" and "End Date"?

A Yes.

Q Did you validate the begin date and end date for each of these categories of violation?

A No. I can tell you right off the bat that I just resist doing the violation calculation; so I usually say to the PUC "Unless you need my help figuring out a start and end date, go ahead and fill it in."

Q So then you don't ask factual questions to assess the reasonableness of the start dates and end dates?

A Well, I'll look at them. For instance, if I saw that a date was completely wrong based on the

data that I had reviewed, then I would say something.

Q Based on the data that you've reviewed.

But you wouldn't ask for information to support specifically the alleged begin date and end date -- and take, for example, Violation Number 84?

A Okay, let's look at 84.

Q Page 4.

A Okay. Okay. And so this one they --

I know they started the date at the date of the memo in 1988 that said, gee, we should look at these wells and assess them for corrosion because of exposure to groundwater; so that started it in 1988. And the end date was the date that the Well SS-25 blew.

Q And for purposes of Violation Number 76 --

A 76.

This would be a date that was established by someone at the PUC having to do with some finding about inability to collect recovery; so I'm not familiar with that, with that date. And the end date, again, is the date that the well blew.

So I'm guessing that someone needed money from the Commission to support a program and delayed some action for that period of time.

Q So you're guessing.

But you don't know the particular facts to support that begin date?

A I don't know the underlying purpose of selecting 12-31-2009.

MR. GRUEN: I'm going to just ask for purposes of this line to reference where in the testimony we're talking to.

There is a testimony section that we're in that this is just the table summarizing violations; so if there is a specific line of questioning about the actual testimony that this refers to, I ask that the witness be directed to that portion of testimony.

MR. STODDARD: You didn't include page numbers here; so the witness is free to reference whatever she needs to reference in this document.

She said she reviewed it in advance of today's deposition. This is --

THE WITNESS: It says II.B, II.C, if I can find it.

MR. STODDARD: Yeah.

THE WITNESS: Looks like it's page 17.

Okay. So this is based on a James Mansdorfer recommendation that they start a Storage Integrity Management Program, but apparently it didn't start -- maybe it didn't start at all, but was

recommended in 2009.

So the start date of the violation was 2009. I'm assuming they picked the last day of the year to start the violation.

BY MR. STODDARD:

Q And why is that your assumption?

A It would be the most conservative choice in 2009. Any other day within 2009 would result in a higher penalty.

Q And you don't know Mr. Mansdorfer, correct, you stated earlier?

A No.

Q And you haven't spoken to him, correct?

A No. I read his interview.

Q You read his EUO?

A Yes.

Q Did you review this --

Did you review the documents aside from --

This is his EUO transcript here that is cited.

Did you speak with anyone else about Mr. Mansdorfer's EUO transcript with respect to this issue aside from Mr. Gruen?

A No. I believe he produced some documents, or maybe SoCalGas produced some documents by him that

I reviewed.

Q That are related to this issue?

A Yes.

Q Turning back to page 3. Again, trying to understand the factual basis for begin date and end date.

Violation Number 3, which is referenced at Testimony Section Number II.B.1.a.

A This is probably about page 16, I would guess. Okay. Okay.

Q Did you find the relevant section?

A Yes.

THE VIDEOGRAPHER: You lost your microphone.

THE WITNESS: I lost it again?

Okay. Is that better?

Okay, number 3. This is --

It says "No investigation on one of four parted well casings."

I had it, I lost it. Okay.

Okay. The violation extends from the Blade report. This has to do with a well. The casing was parted or found to be parted in 1969.

You see the page is number 7?

BY MR. STODDARD:

Q And the basis for that start date?

A That's the date of the first -- the earliest well casing report of a failed well casing in the SoCalGas well records as it was reported to Blade.

So Blade had a history of well casing failures, and that was the earliest one that was reported. And so that date was 1969, not 12-31-1969, but, again, the conservative date would be the last day of that year.

Q Would it be relevant to your testimony on this violation if SoCalGas did not own or control the field at that time?

A I considered that. And it's relevant, but it's not -- not necessarily decisive because SoCalGas was in the process of acquiring -- acquiring the field before 1973, which I think was maybe the operational date. They probably had an application in to the PUC for money to renovate the field.

In order to estimate those costs, they would have to have information about the wells and what they would have to do to them; so I'm guessing -- and I'm only guessing because I don't have records yet, but I would say it's likely that SoCalGas was aware of this problem with this well.

Q So the start date of the violation dates to SoCalGas's knowledge of when the violation -- when

the failure occurred?

A That's how it was set out in this testimony.

Q If SoCalGas did not have control of the field at that time, would you agree that SoCalGas could not have completed a failure investigation on that well at that time?

A I don't know how much control they had over doing investigations into wells that they were about to purchase. I don't have enough knowledge to answer that one way or the other.

Q Assume for the sake of argument, hypothetically speaking, that SoCalGas didn't have control sufficient to conduct an investigation or direct any other operational actions at the field prior to acquisition, would that be relevant to your testimony on this violation?

A I think it might --

Yes, it would be relevant. It would also be relevant to know whether they requested any failure analysis from the prior owner Tidewater.

Q Isn't it likely, Ms. Felts, that SoCalGas didn't possess the well files as of 1969 if they didn't own or control the field?

MR. GRUEN: Objection. Calls for speculation.

She can answer if she knows.

THE WITNESS: They were in the process of acquiring this field for a number of years; so I would guess, again, that some documents had to have exchanged hands, or there was some viewing of documents. I can't imagine SoCalGas bought all of these wells with no knowledge.

BY MR. STODDARD:

Q But to confirm a begin date for this violation is based on your assumption that SoCalGas would have had some form of access to both records and the ability to direct their predecessor in interest to conduct an investigation prior to acquisition?

A The begin date was originally just established on the fact that the parted casing on this well occurred in 1969; so you can argue it however you want to argue it.

Q Well, you said you considered the point that I'm asking --

A Yes.

Q -- which is SoCalGas's date of acquisition?

A And I explained that I think SoCalGas probably had access to information about this well, and may have been able to determine what the cause of this parted casing was.

Q But you don't know, correct?
A That's correct. I don't know anything that SoCalGas doesn't tell me.
Q And you're not aware of any records indicating that that's the case, correct?
A The -- the date, I believe came from Division of Oil and Gas records. But as far as a failure analysis, there is none in the record that I'm aware of.
Q My question was are you aware of any documents or other evidence that SoCalGas had the ability to perform a casing -- a failure investigation at that well prior to acquisition of the field?
A I don't currently have that information.
Q Okay. Thank you.
Referring back to pages 8 and 9 at the top of page 8, do you see there where it says --
And actually you have to turn back, I'm sorry, to the very end of page 7.
-- "Blade reviewed 124 gas storage wells and identified 63 casing leaks, 29 tight spots, 4 parted casings, and 3 other types of failures."
Do you see that?
A Yes.

1 Q And then your testimony discusses those.
2 And then in the bulleted section below it
3 asserts specific violations "for failure to
4 investigate the blowout from Frew-3 spanning from
5 December 31, 1984" to October 23, 2015, the date of
6 the incident.
7 And then a second violation for the failure
8 to investigate the blowout at FF-34A, four violations
9 spanning from 1969 to 1994 related to parted --
10 failure to investigate parted casings, and then
11 60 leaks -- or I'm sorry, 54 violations for failure
12 to investigate an additional 54 leaks.
13 Do you see that?
14 A Yes.
15 Q You indicated earlier that prior to service
16 of your testimony you reviewed well records related
17 to SS-25, SS-25A and SS-25B, correct?
18 A Yes.
19 Q And in the course of that review, you found
20 temperature logs based on which you disagreed with
21 Blade's conclusion regarding a lack of anomalies in
22 the temperature logs at SS-25; is that correct?
23 A Yes.
24 Q For these leaks that are listed here and for
25 the alleged failure to investigate for each, how many

of these well files did you review?

A At the time I was relying entirely on Blade for the counts, and I -- I am not sure, but I believe Blade was relying on Division of Oil and Gas records.

Q And that's also what your belief was for purposes of the temperature log you disagreed with, correct?

Or, rather, their conclusions regarding the lack of anomalies in the temperature log, it was also your belief that they were relying on DOGGR records for that, correct?

A And did not have access to the well logs, yes.

Q Yeah.

So were you satisfied that if they were relying --

In your view or belief they were relying on DOGGR records for purposes of this analysis, what gave you confidence that this was accurate?

A Well, DOGGR records that they were reviewing were actually well histories that are reported by SoCalGas.

So if SoCalGas reported a leak, I'm guessing there was a leak. I don't think there would be any advantage for SoCalGas to report a leak on the well

history if there wasn't one.

So they were just counting up casing failures and leaks, and they were looking for cause -- a determination of the cause of those and not finding that.

Now, I don't know what other access -- without looking at what SoCalGas's responses were to Blade's data requests, I don't know what other information they rely on to do that. But I hope to find out. But I haven't seen it yet.

Q If they were relying on DOGGR records, given your experience or your views on the lack of information there related to the temperature log, isn't it possible that they were still miscounting the number of leaks here?

A I don't see any way they could be miscounting the leaks. Could be undercounting them.

Q That's miscounting, correct?

A Yes, but it would be to the advantage of SoCalGas if they undercounted.

Q Does the characterization of the type of leak matter for purposes of violations related to failure to investigate?

A A leak is a leak, so I would say no, although --

You could have, for instance, five holes in the same location, in a very small area in a pipe and call it one leak, whereas I think within the industry, a leak is just a failure of the casing.

So, you know, how you count the leak may determine on how detailed you get in terms of how many holes are in a piece of pipe.

Generally, I think SoCalGas would probably report just a failure. If they had a failure and they had to patch it, they wouldn't count the number of holes that were under the patch. It would be one leak.

Q What about leaks that aren't in the body of the casing, is that relevant in your view?

A Leaks, for instance?

Q For instance, a shoe leak.

A Well, a shoe leak is important because you lose gas through it.

So if you're in the business of storing gas for your own business or for someone else, you don't want to be losing it into a part of a reservoir where you can't get it back.

Q And what about leaks, "Leaks" that are the result of faulty -- something like a valve that may not be operating properly, would that in your view be

a leak, a mechanical piece of the well?

A What are you talking about, a release of the gas into the well or external to the well?

Q A leak that would show up on a temperature log.

A I don't know how that would show up on a temperature log.

Q All right. Let me ask it differently.

Are you aware of any instances where an operator might deliberately put holes in a tubular or casing?

A You would perforate a casing purposely, yes. That would be so you can either inject or extract the gas from that level of the reservoir.

Q Would it ever be done for purposes of cementing?

A Yes.

Q And are those holes on occasion plugged with cement?

A Sometimes.

Q And if one of those holes were to be leaking gas, in your view, is that a leak that requires investigation or simply repair?

A I would suppose if they understood exactly what was going on that they would just patch it, and

there would be no purpose to investigate it because the recurrence is not likely to occur unless, say, something was dissolving the cement.

Q I'm going to direct you to page 13 of your testimony.

A Okay.

Q You'll see here this relates to the heading "SoCalGas Did Not Implement a Risk Assessment Program Or Wellbore Integrity Management Plan on the Aliso Canyon Storage Facility Prior to October 23, 2015," and if you turn to page 16, which is the end of this section under this heading, it states "SoCalGas's failure to implement any form of risk assessment program or wellbore integrity management plan on the Aliso Canyon storage facility prior to October 23, 2015, and beginning 2009 and continuing through the date of the incident, constitutes a separate violation of Section 451 for each day it failed to implement the risk assessment program."

Do you see that?

A Yes.

Q And then I'm going to refer to the next two sections, section b) also relates to SoCalGas's failure to implement a risk assessment program or wellbore integrity management plan prior to the date

of the leak.

Do you see that?

A Yes.

Q And resulted in the failure to detect corrosion on the well at the 7-inch casing prior to October 23, 2015.

Prior to October 23, 2015 would include 2009, would it not?

A Yes.

Q Aren't these two violations really the same thing, which is SoCalGas's alleged failure to implement a risk assessment program or wellbore integrity management plan?

MR. GRUEN: Objection. Calls for legal conclusion.

MR. STODDARD: All right. I'll ask it in a different way.

Q The underlying conduct, which is a factual question, that serves as the basis for these violations is the same, is it not?

A Yes.

Q And that's also true for the next Section c) "SoCalGas Did Not Start a Storage Integrity Management Program in 2009, Even Though It Was Recommended by Its Storage Engineer Manager At

That Time Because They Could Not Yet Collect It in Rates," is that correct?

A The start date and underlying issue of storage, no storage integrity management program is the same.

Second half of it is different, and it has to do with a decision they made -- SoCalGas apparently made related to not being able to collect and rate the money to start the program. Slightly different in my mind.

Q But the underlying conduct related to the violation is the failure to initiate an integrity management program, correct?

A That's what it's linked to, yes.

Q Okay. Thank you.

And for all three of these sections on pages 13, Section a), 16 Section B), and 17 Section C) the basis for the statutory violation legally is Section 451, correct?

A Yes.

Q Ms. Felts, do you know which agencies are involved with regulation of gas storage operations in the state of California?

A Department of Oil and Gas would be the primary agency. I would expect the Energy Commission

might have some interest as a secondary.

The Public Utilities Commission, because they're operated by utilities, the Air Board probably has an interest because of air emissions, and the possibly local water boards because of potential water discharge from separators and that sort of thing on the surface. And probably also for groundwater contamination.

Q And at the federal level, are you aware?

A I would think that California would probably have most of the authority, although there might be some authority under PHMSA for some of the pipelines that are connected to the gas storage.

Q Are you aware of the memoranda of understanding related to the Aliso Canyon investigation between DOGGR and the CPUC?

A I have not seen it.

Q You have not seen it. Okay.

Which agency do you believe has primary jurisdiction over down hole gas storage and gas storage wells?

A Department of Oil and Gas.

Q I want to refer back to your testimony. This again is Exhibit 1-7 page 18. Paragraph -- or I'm sorry, header 3, "SoCalGas did not have a dual

mechanical barrier system in the wellbore of SS-25, instead leaving the 7-inch production casing as the primary barrier to the gas."

Do you see that?

A Yes.

Q Can you explain exactly what is meant by a "dual mechanical barrier" here?

A The idea would be to have it designed so that you have tubing going down the middle of it and then an external casing finished through your top casing so that your external casing is separate -- serves as a barrier. But in this case, because they were producing and injecting through both the casing and the tubing, then you lose the protection you don't have in, like, a second wall outside of your production casing.

So in this case Blade is saying that they didn't have that extra protection; so when the 7-inch casing failed, there was nothing outside of it to contain the gas. It was a true failure.

Q Are you familiar with the usage of dual mechanical barrier at other gas storage fields?

A I actually don't know what the -- I don't know what technology is used in the wells in other storage fields around the United States. I haven't

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1 looked into that.
2 Q Okay.
3 A I'm assuming Blade knows.
4 Q I'm going to refer you now to page 19. And
5 there is an embedded quote. And this discusses
6 SSSVs.
7 Do you see that?
8 This -- I'm sorry, this is the embedded
9 quote at the bottom of page 19. "Also as noted by
10 SoCalGas's Storage Engineering Manager, James
11 Mansdorfer."
12 A Okay.
13 Q And the discussion of subsurface safety
14 valves goes on to page 20.
15 A Yes.
16 Q Can you explain how subsurface safety valves
17 relate to the lack of a dual mechanical barrier?
18 A Apparently they did not at the time have SSV
19 that would accommodate injection and production out
20 of both tubing and the casing. Though they installed
21 some, I think they installed three different ones in
22 SS-25 very early on and ended up removing them or
23 removing the guts of the valves because they couldn't
24 get them to work.
25 And then in later -- I saw maybe this quote

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is from that note -- memo from James Mansdorfer that he thought there was a new technology out there that they could probably install in some of the wells that would accommodate that sort of production and injection.

Q I don't believe that exactly answered my question.

I am wondering how SSSVs relate to the dual mechanical barrier issue or whether they do?

A I think I answered that. I don't know why --

Q Rather than I -- if you could restate your response. I'm not --

I can see the history that is accounted here, but operationally do they -- does inclusion of an SSSV provide a dual mechanical barrier?

A No.

Q Okay. If a field is converted to tubing flow only, those wells would have a dual mechanical barrier, correct?

A Yes.

Q Do you know what the diameter of -- the range of diameters for tubing is relative to a production casing in a gas storage operation roughly?

A Do you want a range of the size of tubing?

Q Let me restate the question.

Tubing is significantly narrower than casing, correct?

A In this case, it's 3-7/8 and the casing outside of it is 7-inch.

Q So converting a field like Aliso Canyon to tubing outflow only would have a significant impact on deliverability, correct?

A Not necessarily.

Q How so?

A I think it --

Because they can replace the tubing with a larger tubing. And the efficiency of a well depends on more things than just the size of the tubing; so it depends on the permeability of the reservoirs they're producing out of, how much gas they can pack in at what pressure and how fast that will flow back.

There could be other factors in the design of the well and the well head that would allow for a more efficient production; so I don't think you can just pin it on the size of the -- the initial size of the tubing.

Q "The initial size of the tubing."

So let me ask another question and see if this helps clarify it.

But taking an existing field with the parameters you noted as factors in deliverability, if you take an existing field, holding all of those parameters constant, and you put tubing into an -- existing wells that presently has 7-inch casing, would that reduce deliverability of that field?

A If I put a new tubing in it?

Q Uh-huh.

A At what size?

Q You indicated big tubing.

A Well, you can't go any bigger than the 7-inch casing. But I think that they have tubing that is in the 3- to 5-inch size. And, I mean, here again, you would have to ask a drilling company to spec that out for you to make sure that it would work.

Q So let's say 3-inch.

A Okay.

Q Would that reduce deliverability to the field?

A Not if you're going from a 2-7/8 to a 3-inch.

Q If you're putting -- I'm sorry, if you're putting new tubing into a field that presently doesn't operate as a tubing flow only field, so if

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you're presently operating it as a dual flow gas storage field, and you convert it to tubing flow only and you're extracting it through a 3-inch tube, would that reduce deliverability to the field?

A If you hold everything constant, and all you're doing is you're going to produce out of the tubing and not out of the casing, then you're going to have a reduced flow.

Does that answer it?

Q Yes.

A You don't have to replace the tubing.

No matter what you do, if you're not producing out of the casing and you keep the casing the same size, you're still going to have reduced flow, and holding everything else constant, if you don't do anything else to improve efficiency.

Q Okay. Turning to page 23, middle of the third paragraph down where it states "It is not possible to determine what an inspection of the SS-25 casing would have shown in 1988, but it is possible that the corrosion was present and detectable, and steps could have been taken to avoid the leak in 2015."

Do you see that?

A Yes.

Q And the next sentence says "SoCalGas logged some of the 13 remaining wells starting in 2007, resulting in a gap from 1990 to 2007 when no inspection logs were run in the 20 wells, according to the available well records."

Do you see that?

A Yes.

Q And this relates to the 20 wells that were on the 1988 memo, correct?

A Yes.

Q Did you evaluate the logs of any of the 13 remaining wells that were logged starting in 2007 referenced in that second sentence?

A Not before this testimony was published.

Q Have you done so since?

A Some of them, yes.

Q And what did they show you?

A I think that's probably part of my future testimony, so --

MR. GRUEN: We'll note the objection for the record.

MR. STODDARD: And the objection is?

MR. GRUEN: The objection is that this is protected under attorney-client and attorney work product privilege to the extent that it covers work

that is going to be -- testimony that is going to be produced in the future. Excuse me.

BY MR. STODDARD:

Q Please turn to page 27, middle paragraph.

Do you see the sentence that says "Further, since no formal risk assessment was conducted regarding well integrity, wall thickness inspection was not identified as a monitoring technique"?

A Yes.

Q Do you contend that SoCalGas was unaware of casing inspection tools?

A No.

Q Can you explain your statement there what you meant by "was not identified"?

A I think this statement comes from Blade, and basically I -- what I think I am saying there is that since there wasn't a formal risk assessment conducted, it wasn't possible to -- to say that wall thickness inspection was performed.

So, in other words, if you had a risk assessment, a formal risk assessment, it would have the results of this monitoring technique. It would be pretty common in one of the first things you would do in a formal risk assessment. But without a risk assessment to look at, I can't conclude that the tool

was used.

Q And you say you think that's what you're saying, but this is based entirely on the Blade report, correct?

A Well, it came out of the Blade report, yes.

Q So this is what Blade is saying?

A Yes.

Q Turn to page 72, please.

A Okay.

Q Do you see where it states the "Well file for SS-25A contains information" --

In the second paragraph?

A Yes.

Q -- "that might have been useful to SoCalGas and its contractor in calculating the appropriate requirements to kill the well in October 2015 and thereafter."

A Yes.

Q What information were you referring to there?

A I believe it's attached as an exhibit. It was --

I'm just remembering that it's a Halliburton report on the reservoir characteristics that were logged by Halliburton. I'm not sure what the date

was. But it included permeability readings for the full depth of the well.

Q So maybe it would be helpful just to read the rest of the paragraph.

"For example, the Permeability of the Aliso reservoir is in a record in that file."

A Yes.

Q And can you explain how permeability was a factor for purposes of the well kill?

A When you look at the Blade model results, Blade had to assume a permeability. They didn't have the data; so the data was also not in the SS-25 well file, it was in SS-25A.

So if someone went to look for permeability, which would have been useful in their calculations or models, assuming that any of the contractors like Boots & Coots were actually doing calculations, say, on a calculator or computer that we don't know about, but let's say that they were, they would need that piece of data.

And so there is a statement in the Blade report that says if you change the permeability in the model that they were running, you got different results. And so I went looking for the permeability data to see if it was available to Boots & Coots.

And for SS-25, it was not in that file, but it was in the SS-25A file. And since they're right next to each other, it would have been relevant.

Q And you said that that document was not available to Blade, correct?

A Not available -- apparently not available. They --

Q To Blade?

A Yes.

Q Yeah.

Boots & Coots is the operator that performed the well kill, correct?

A Yes.

Q Earlier you indicated you don't have any -- any experience with well-control operations, correct?

A Not directly.

Q So then you're not aware of whether permeability of the reservoir is something that a well-control operator would typically consult or reference or consider?

A I just went by what was reported in the Blade report that they needed in order to do their calculations.

So this was part of their -- part of their calculations, and it was a factor that they didn't

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have and had to make some assumptions about.

Q Okay. Let's move on to the next sentence in the SS-25A well file.

There is an example of a well kill that failed due to the use of an incorrect bottom hole pressure.

A Yes.

Q This is another record that you contend might have been useful to SoCalGas and its contractor in calculating the appropriate requirements to kill the well, correct?

A Yes.

Q Do you believe an incorrect bottom hole pressure here was the reason that the well-kill operation failed?

A Yes.

Q And what is your basis for that belief?

A Well, again, the models that Blade ran consistently showed that they weren't weighting the material properly. It wasn't heavy enough to overcome the reservoir pressure, and they actually recalculated based on old data that was provided or acquired from SoCalGas and came up with a higher bottom hole pressure, Blade did.

Q And you believe this is the case for kills 2

through 6?

A Yes.

Q The next sentence is "Other examples include the shallow leak on SS-25A and the formation of hydrates in an instance of leak repair, which may have been useful information."

Do you contend that Boots & Coots did not understand how to clear the hydrate that formed -- or according to Blade the hydrate that formed at SS-25A -- or, I'm sorry, at SS-25 during leak response?

A No.

Q Do you contend that Boots & Coots was unaware that there were hydrates in the well during the second well-kill attempt?

A At the time --

Q Let me restate that. I'm sorry.

Do you contend that Boots & Coots was unaware of the potential for hydrates after the first well-kill attempt?

A No. I think they were always aware of the potential.

Q How specifically would the document related to formation of hydrates in the instance of leak repair been useful to SoCalGas or Boots & Coots with

respect to the leak response?

A Well, without looking at the reference documents, I can't say specifically. But as I recall just sitting here, I believe there was a shallow leak that might have been informative as to the depth of the leak, and I don't remember the issue having to do with the hydrates just offhand.

Q And to reiterate, based on these, the footnote citations, this is based on your independent review of the well file and not the Blade report, correct?

A That's correct.

Q And Blade did not raise these concerns regarding these records in connection with the well kill, correct, to your knowledge?

A No. Let me correct that.

They raised the issue of not knowing the permeability because that was in their report.

Q Blade not knowing the permeability?

A Yes, and not having -- not having access to that data; so they made an assumption about what the permeability was. I'm not sure what that was based on. But they did provide additional calculations in their report with different permeabilities and said if it was this permeability, this would have

happened. So they were clearly considering a range.

Q But Blade did not raise the document-related issues related to the other items -- the other examples that you provide in this paragraph in connection with the well-kill operation, correct?

A It's not in their report.

(Discussion off the record.)

MR. STODDARD: I guess can we go off the record for a moment, please.

THE VIDEOGRAPHER: Just a moment, please.

We are off the record at 5:59 p.m.

MR. STODDARD: This is the end of disk number four, Volume Number 1, of the deposition of Margaret Felts on February 5th of the year 2020.

(Off the record.)

THE VIDEOGRAPHER: This is the beginning of disk number five, Volume Number 1, of the deposition of Margaret Felts on February 5th of the year 2020.

We are on the record at 6:22 p.m.

BY MR. STODDARD:

Q Ms. Felts, picking back up again with Exhibit 1-7, I'm going to direct you to page 44 and 45.

The heading for this section is titled, starting with lower case b) "SoCalGas Did Not Assess

the Relationship Between Groundwater In and Around the SS-25 Well Site, and The Surface Casing Corrosion of That Well."

Do you see that?

A Yes.

Q And on page 45 it states "SoCalGas's failure to assess the relationship between groundwater in and around the SS-25 wellsite and the surface casing corrosion of that well on SS-25 constitute a violation of Section 451."

Do you see that?

A Yes.

Q What is your understanding of practices at other gas storage fields relating to the assessment of the relationship between groundwater and well casings?

A Anybody who drills a well has to at least have a preliminary idea of where the groundwater is; so that starts because you case down to the bottom of the groundwater, fresh groundwater.

Q And by "case down," you mean set your surface casing?

A Yes.

And so after that I would not know exactly what the practices are at other gas facilities.

Q Okay. Thank you.

In terms of how to assess the relationship, do you know how Blade assessed it for purposes of their RCA investigation?

A I think they drilled a couple of wells.

Q And do you believe that that would be required in the proximity of each well at Aliso Canyon to understand the relationship between groundwater and the wells?

MR. GRUEN: Again, I'm going to note the objection that this is calling for SED to recommend investigations to SoCalGas as to how to investigate its field, which is beyond the scope of SED's purview.

But she can answer.

MR. STODDARD: Actually, let me restate the question.

Q Ms. Felts, what is your understanding regarding how to assess the relationship of groundwater in a storage field relative to the casings in a gas well?

A There are options. You might do them all. One is the simple option of being very familiar with the geology after drilling wells and/or looking at the geology reports from the drilling and then

1 understanding where sands, sand lenses outcrop and
2 water would fall on the sand at the outcrop and run
3 down the -- that part, that part of the strata. And
4 so where it would impact each well, you would know
5 approximately the thickness of that sand, and that
6 would be the exposure to that amount of water; so
7 that's a geologic approach that requires no drilling.
8 In addition to -- or alternatively, you
9 could set monitoring wells in those sands that are
10 cased to and then open to those sands so that you
11 could monitor the depth of groundwater at any point
12 in the area. You would have to --
13 You wouldn't set a well next to every well,
14 but you would set a monitoring well in an appropriate
15 place where your geologist thinks that there might be
16 some variation in the depth of water in that lens,
17 that sand lens.
18 There could be other ways to do some sort of
19 monitoring that might hit in between those two. You
20 might have historical water production when you were
21 drilling a well like a newer well and be able to
22 report that, and then connect that to a sand lens and
23 have the knowledge in the record that there is water
24 in a -- at a certain depth in one well that might
25 carry over to another one because of the geology.

Q Okay. And circling back on your earlier statement, it would be necessary to have an understanding of groundwater depths for purposes of setting the surface casing, correct?

A Yes.

Q Okay. Also on page 45, you see the discussion of cathodic protection, where it states "Cathodic protection systems are commonly used to protect pipelines from corrosion and are sometimes used on well surface casing strings"?

A Yes.

Q What is your understanding of how cathodic protection works?

A Do you want a technical explanation or just something generic?

Q Your choice.

A Well, there is --

I guess you would look for a location that would be defined on an anode on a well casing or a pipeline, and a cathode location somewhere else. And the flow of electricity from one to the other can result in the removal of metal, usually iron, but also iron component of steel, from an unprotected pipeline.

So then when you do cathodic protection, you

basically reverse the polarity on that flow, on that electrical flow.

Q Also on page 45 you state "Cathodic protection would have provided corrosion protection to the 11 3/4-inch casing, but would not have protected the 7 inch casing inside the 11 3/4 inch casing."

Is that correct?

A Yes.

Q Why is it important in the context of your testimony and alleged violations that cathodic protection be applied to a surface casing if it would not have protected the 7-inch casing?

A Well, so the purpose of providing it to the surface casing was because that was what is exposed to water so more likely to corrode.

And what was the other half of your question?

Q That's fine. I can ask another question.

Did corrosion to the surface casing in your view cause the failure in the 7-inch production casing at SS-25?

A I'd have to go back and look at the details of the Blade report, but my understanding is that there was water entering the -- water entering the

casing at some point the surface casing or below at the 7-inch casing that was causing external corrosion; so I'd have to look at the drawing and tell you whether I could answer that specific question correctly.

Q Water also could have been coming up from under, correct?

A Coming up from under --

Q Under the shoe?

Could have been entering --

A Could have been, yes. It could actually just be produced with the gas. There is no telling how you can get water into a well.

Q So you're not contending that corrosion of the surface casing was the point of entry for water that caused the corrosion at SS-25 production casing?

A I am not. But Blade seems to think that that was contributing to it because they found the MIC in the -- as a cause of the corrosion, which would require some moisture; so I think they tied it to surface moisture or shallow moisture.

Q But you're not sure?

A I'd have to go back and look at it. It's been a while since I read that section.

Q Do you have prior experience with cathodic

protection?

A Well, I reviewed a lot of records with PG&E on cathodic protection. And before that we had cathodic protection on pipes at the oil refinery and at the chemical refinery where I worked.

And other than that, as a consultant, I think the only places I might have run into it is if there was cathodic protection on piping or underground storage tank systems that had to be disabled while we worked on them is all. I didn't have to operate it or analyze it.

Q Okay. So you reviewed records related to it; you didn't personally apply cathodic protection?

A No.

Q Or advise regarding installation of cathodic protection?

A I would call an expert in cathodic protection.

Q And in the cases you mentioned before, they were all pipeline cases; is that correct?

A Maybe underground storage tanks. I'm not sure.

Q What sort of underground storage tanks?

A It would be petroleum.

Q Are there any --

Is there any difference that you're aware of applying cathodic protection to above-ground pipes versus underground storage wells?

A I think it's a little bit more complicated for underground wells because they're vertical, and because you might have, like, SS-25 and 25A and 25B, co-located wells that will interfere if you don't design the system correctly.

Q How --

A But it's not impossible. It's just that it's a different application of cathodic protection.

Q Can you explain how you avoid interference with neighboring wells through system design?

A No. But I can look it up for you, and I can call an expert. And I think I provided some reference documents that included that information in response to DR 3.

DR 3? Your DR 3.

Q Data Response 3?

A Yes.

Q And those documents --

Did you prepare Data Response 3?

A Yes.

Q And you collected the documents --

A Yes.

Q -- for purposes of Data Response 3?
A Yes.
Q Do you recall when you collected those documents?
A After we received Data Request 3, whenever that was.
Q Is it your opinion that cathodic protection should be applied at the surface casings of all gas storage wells?
A I think it should be applied where there is a threat of corrosion. There may be instances where there is not.
Q There may be instances where there is no threat of corrosion in a gas storage well in the ground?
A Well, yes. I think that's possible.
Q Are you aware of any specific examples of that?
A I think actually in the Aliso field there might be some areas that they feel like would not require it, and then there is other areas where they think it's necessary.
Q But if there is a threat of corrosion, which would include, based on what you said previously, I'm guessing presence of water generally in the

environment, geology perhaps, you would believe cathodic protection is appropriate if there is a risk of corrosion?

A It certainly is a technology that should be investigated. There is other things you can do. You can put chemicals down the well. You can coat the casing if you happen to be drilling the well now and installing it. There --

You know, I think there are other things that you could do if you did not want to apply cathodic protection. But I do think that cathodic protection is the first thing that most engineers would look at.

Q In terms of putting chemicals down the well, what sort of chemicals are you referring to there?

A Well, typically it would be something like biocide, something to kill the MIC.

Q And that would generally protect against corrosion of the internal diameter of the casing, correct?

A Yes, won't help you with the external.

Q And in terms of the specially-treated casings, that's --

A External.

Q That's external --

A It could be external and internal.
Q But again for newly-drilled wells --
A Well, yeah, if your casing is already --
Q -- not for existing wells?
A -- in ground and cemented, you're not going to be able to do it.
Q Thank you.
Is it your opinion that SoCalGas should have cemented the production casing at SS-25 all the way to the surface?
MR. GRUEN: Objection. Just vague as to time.
BY MR. STODDARD:
Q Is it your contention that SoCalGas should have cemented the surface casing at SS-25 all the way to surface sometime after it acquired the field?
A It would have been a prudent thing to do.
Q For existing wells that are in gas storage fields in California that are not cemented to surface, do you believe that those wells should be cemented to surface to protect against the risk of corrosion?
A You mean should they be done -- should it be done now?
Q Should it be a retrofit?
A I think it's an economic assessment that

needs to be done there to determine what the risk is of leaving it as is versus cementing it and having the protection for the rest of the life of the well. And some of those wells are pretty old; maybe it's not cost effective. Maybe you're going to be shutting them down pretty soon anyway and replacing them.

Q So cost effectiveness of the measure would be relevant to the consideration of whether it should be done?

A I think so. But also risk assessment. If there is a risk of it blowing out, that could be part of your cost-effective calculation.

Q Would you contend that a failure to cement an existing well to surface would be a violation of 451?

A Probably depends on the specifics of the well.

Q Including cost effectiveness.

A Well, for a 451 violation, I think we would look at the risk primarily of there being a failure that would create a problem at the surface.

Q As well as feasibility of the operation?

A Feasibility would certainly be part of the equation.

Q Would assessment of risk include past success with addressing well failures and leaks?
A For example? What do you mean?
Q If an operator had -- historically had success with identifying leaks and repairing them as they arose, would that be relevant to your consideration as to whether it would be a violation of 451 if they chose not to cement the casing to surface?
A So we're still talking about casing, the surface casing?
Q Sure. Uh-huh. No, I'm sorry, the cementing.
A "Cementing"?
Q Yeah.
A So if they had a good record in the past of fixing leaks in surface casing that was not cemented, would that be relevant to the decision not to cement?
Q Let me restate this.
A Okay.
Q And let's limit this to the cementing issue.
A Okay.
Q You said that --
We talked about how cost effectiveness would be one factor in considering whether or not to cement

to surface.

You said risk assessment would be another factor?

A Yes.

Q My question is whether part of that risk assessment would include past success with addressing and fixing leaks as they arose.

A I wouldn't give that a lot of weight unless in the process there had been determination of what the cause of those leaks were; so you could accurately forecast whether or not the problem was going to continue with other wells.

So if all they're doing is patching things to keep -- and well after well is failing for the same reason, but they don't know the reason that it's failing, then you would know things are going to continue to fail. And in that instance, the fact that they're successful at plugging holes in wells doesn't really help with a risk assessment, because the risk continues for other wells. They're going to continue to leak if you don't know how to stop the cause of the leaks.

Q Is that true if the consequences of those leaks are not significant?

A Well, I suppose SoCalGas might be able to

categorize some leaks as not consequential or not important and others important. But I'm not aware of how they would do that.

You know, a failed well is a failed well, and you have to fix it. And if you don't want it to happen to the next well over, then you need to find out why it failed.

Q Speaking hypothetically and abstractly, frankly not even in the context of gas storage operations, would you agree that a risk assessment should include both the likelihood of a given event and the consequences of the event?

A That's a typical statement for pipeline risk assessments.

Q Okay. Moving on to page 47 of the same exhibit. This violation -- alleged violation is related to -- stated as "SoCalGas lacked a real-time continuous pressure monitoring system for well surveillance, which prevented an immediate identification of the SS-25 leak and an accurate estimation of the gas flow rate."

Are you familiar with what other gas storage operators do with respect to real-time pressure monitoring?

Let me restate that.

Are you familiar with what other gas storage operators did as of October 23, 2015 with respect to real-time pressure monitoring?

A No. I did not look into that. This is based on the Blade report and what they determined.

Q What is your understanding of what SoCalGas would have done or could have done had they immediately identified the leak due to real-time pressure monitoring?

MR. GRUEN: I'm going to --

MR. STODDARD: I'm sorry, I'll restate that.

Q If SoCalGas had been able to immediately identify the leak because of a real-time pressure monitoring system, what do you contend SoCalGas could have done that would have helped mitigate the consequences of the incident?

MR. GRUEN: I'm going to note an objection to the extent this is calling for Ms. Felts to recommend fixes or recommend investigations.

Again, this is outside the purview of SED and it is -- so it's beyond the scope of what SED is called to do.

But Ms. Felts can answer the question.

THE WITNESS: Okay. Just a minute. Let me see what Blade said on this.

Okay. So on page 48 there is additional information about that.

BY MR. STODDARD:

Q Would you please read?

A In the third paragraph, "The lack of real-time pressure measurements prevented the immediate identification of the 7-inch casing failure."

I guess you might have to read the paragraph ahead of that to get the context.

"But constant monitoring of the tubing production casing and surface casing pressures will provide better insight into operational deviations in all wells."

So I think here the concept is that if you have real-time data, you would be able to see exactly what was going on in the well, and because they didn't have that, they were somewhat hampered in being able to detect a leak before it actually broke out to the surface and they started to smell it, which I think is the way they detected it.

So this is a plan, an idea of how SoCalGas could have been monitoring the system to see the -- see the leak in an operational data manner rather than just waiting until it leaks to the surface.

Q I understand how -- your response, I believe, describes how continuous real-time pressure monitoring would have enabled identification of the leak at an earlier time.

A Right.

Q What would that identification have enabled SoCalGas to do in response?

A Their response would probably still be to shut down the well and I'm guessing and to start a well-kill process. It's probably Blade's thought on this, and I think you would have to ask Blade, that an earlier detection might have prevented some of the damage from occurring and might have allowed the first -- the initial well kill to be successful. But here again, I think you should ask Blade that question, not me.

Q Well, it is your testimony; so I'm going to ask you.

How would shutting the well immediately have prevented further damage in your view?

A Well, this well was already leaking through the casing when they shut it down, whereas -- I mean, significantly leaking. If they had been able to detect a smaller leak first, they might have had a better outcome on their original well kill. That's

my read on it.

Q How much earlier do you think that would have needed to be? Are we talking minutes, hours, weeks?

A I would --

I don't know because I don't know how fast the problem within the well was occurring. But my understanding is that the real failure that caused -- caused the detection outside of the well on that day was fairly sudden.

I mean, the loss of gas at that -- in that amount was a result of a fairly sudden event within the well.

On the other hand, microbial corrosion and small leaks through holes is not sudden. And so it's possible they might have picked up a problem earlier, maybe even weeks earlier, through regular monitoring.

Q So a continuous real-time pressure monitoring system would have been useful in identifying development of a leak over a period of time?

A Right. Or a major leak. I think you would be -- you would be looking at a leak, but a major leak might be preventible.

Do you understand?

Q A major leak might be preventible if you catch it early?

A Yes.

Q As it's developing?

A You would catch a smaller leak earlier, right.

Q Okay. Separately the second part of the statement in paragraph 8 on page 47, the first is the immediate identification of the leak, which we discussed. The second, an accurate estimation of the gas flow rate.

Can you explain why continuous real-time pressure monitoring is necessary for accurate estimation of the flow rate?

A If they had detected the well, the problem earlier, they would have been able to shut in the well, avoid the catastrophic failure of the pipe casing, and then they might have had a better chance of being able to estimate the gas flow rate or would have had a better measure of gas flow at the time the well was shut in.

So what they did was they let the well fail for lack of monitoring, and once it failed and was blowing out, up the side of the casing, there wasn't a way to measure the gas flow rate.

Q So you don't believe that they could get accurate -- or that --

You are aware that there are pressure gauges on the well head and on the casing?

A Yes, but that was useless once the well blew out.

Q Why is that?

A Because the gas was coming up outside of the well. It wasn't coming up through those, past those instruments anymore.

Q And prior to the blowout?

A Well, prior to the blowout they had measurements of the flow in and out of the well through the piping and the instrumentation. After the blowout, that instrumentation wasn't useful.

Q So what would a continuous real-time pressure monitoring system have provided that they couldn't have collected prior to the blowout?

A The way I connect this is that the real-time monitoring system would have probably prevented the blowout because they would have detected the leak at a lesser amount and shut in the well; so they would have had their readings at that point in time. But if they shut in the well, they wouldn't have to use the readings. They would have the flow, but it's

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kind of --

Q So it's more about the ability to shut in the well and prevent further development of a smaller leak into a bigger leak --

A Right.

Q -- than it is about the flow rate?

A I think so.

Q Okay. But you're not sure?

A Well, because that seems to be tacked onto there, and I don't know why, I would have to go back and look at it again to see how that developed.

Q I don't know either. I'm sorry, I interrupted you.

I mean for purposes of this violation, you would agree that you're relying heavily on the Blade report, correct?

A Yes.

Q Entirely on the Blade report?

A This one is from the Blade report, yes.

Q And maybe you don't fully understand what Blade was saying on this issue.

A I think the -- I think the caption here was refined from the Blade report, and so it looks to me like two issues are merged together here.

But since it's all one violation, I don't

1 know if it makes any difference if you drop out the
2 accurate estimation of gas flow rate, it's still the
3 same violation.
4 Q So you believe you understand and have
5 accurately stated Blade's position with respect to
6 preventing development of a leak over time by
7 shutting in a well?
8 A I think the following -- the text that
9 follows that heading -- the heading is a little
10 weird, but the text that follows it I think
11 accurately represents what Blade said.
12 Q Do you believe, Ms. Felts, that it's
13 important or critical when you're asserting
14 violations that you have a good understanding of the
15 underlying facts related to and supporting those
16 violations?
17 A Sure.
18 Q On page 50, it says in the middle paragraph,
19 "Industry technology has evolved for real time
20 pressure, temperature, flow, and vibration monitoring
21 but, surprisingly, there were no significant
22 differences in the monitoring plan from 1989."
23 Do you see that sentence?
24 A Yes.
25 Q How has industry technology evolved -- let

me restate that. I'm going to break these into separate questions.

How has industry technology evolved for real-time pressure monitoring?

A Well, I think over a period of time the accuracy and reliability of any instrumentation that might be used on a well has improved.

Q How has technology evolved for temperature monitoring?

A I would say not a lot. It's still pretty much the same log. There may be more accuracy in the feedback on the log. But basic technology is the same.

Q So then the statement you don't agree with?

A I don't not agree with it. I am just not aware of whatever Blade was aware of. It's footnoted to Blade's report, and apparently they have an opinion about that that you could ask them about.

Q Turning to page 51, Section C. "Additional Violations," Number 1 is "SoCalGas Knew That SS-25 Released Both Crude Oil and Natural Gas During the Aliso Canyon Natural Gas Storage Incident, But Did Not Disclose This Fact to the Los Angeles Department of Public Health."

Do you see that section?

A Yes.
Q You weren't personally involved in any discussions with DPH related to this issue, were you?
A No.
Q What did you do to get yourself comfortable with sponsoring your testimony on this issue?
A Originally my understanding was that the Department of Public Health was going to sponsor this section and would support it, and so I didn't do anything other than read it. But I do have a background in environmental technologies, environmental issues, and so I felt like I was pretty comfortable with supporting it.
Q But you didn't have personal knowledge relating to the Department of Public Health's specific dispute here with SoCalGas, correct?
A The only thing I had were the letters that went back and forth that were provided to me. I think they're attachments.
Q If you turn to page 52, do you see the last sentence of this section which says "These dates and the precise nature of this violation may be modified pending additional testimony from intervening parties to this proceeding with expertise in public health"?
A Yes.

Q Intervening parties based on your prior statement, I understand that intervening parties to this proceeding with expertise in public health was DPH?

A That was my understanding.

Q Were there other potential parties that you were aware of?

MR. GRUEN: Objection. Calls for speculation.

BY MR. STODDARD:

Q Were you aware of any other parties that were being actually -- no, I'm going to restate it.

Were you aware of any other parties that were considering intervening in this proceeding on this issue?

A As interveners.

Q The sentence says "These dates and the precise nature of this violation may be modified pending additional testimony from intervening parties to this proceeding with expertise in public health."

I'm asking whether "parties" there refers to anyone other than DPH?

A I don't know.

Q You're not aware of anyone else that would have been?

A I was not told of anyone else.

Q Okay. Did you draft this sentence?
A No.
Q And it's your understanding that there was an arrangement by which DPH would come and provide the supporting factual basis for this violation?
A Yes.
Q You indicated that you reviewed letters related to this violation; is that correct?
A There is at least one letter from DPH to SoCalGas and one from SoCalGas to DPH that I believe were attachments to this testimony that I read.
MR. STODDARD: I'm going to introduce Exhibit 1-31.
(Deposition Exhibit 1-31 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A Yes.
Q You reviewed this letter?
A Yes.
Q And you considered SoCalGas's arguments outlined in the five paragraphs on pages 1, 2 and 3?
A Yes.
Q Did you discuss with Darryl whether or not

to include this violation based on SoCalGas's response?

A I looked at this letter, and then I looked at actually --

I was going to say that I looked at the analysis that SoCalGas did, but that was after the testimony came out. So I had this letter. I think that the main thing that I discussed with Darryl was that it was the statement on page 2, it says the --

See on page 2, the second full paragraph says, "Consistent with those statements air samples taken by DPH and other agencies during and immediately after the incident were analyzed for compounds that are typically found in crude oil, including benzene, toluene, ethylbenzene and xylene," which is typically referred to as BTEX.

That statement concerned me because naturally those four things are typically found in crude oil, but they would not necessarily tell you what heavy components of oil might be dropping out of the air emissions from the well.

So I felt like this is only a partial -- a partial answer, that it seemed like DPH had asked for a more extensive analysis of the air emissions, the gas emissions and didn't get it.

Q As framed the violation relates to a failure to disclose, correct?
A I understand that, and I agree with you, yes.
Q Okay. Thank you.
Turn to page 52, please.
A Okay.
Q See paragraph 2, "In Multiple Instances, SoCalGas Did Not Cooperate with SED During Its Pre-Formal Investigation Following the Incident on Aliso Well SS-25 that Began on October 23, 2015."
Do you see that paragraph?
A Yes.
Q You were not personally involved in SED's preliminary investigation, correct?
A No.
Didn't we discuss this earlier? Seems like we've already been through this one.
Q Not what we're about to discuss.
A Okay.
Q Did you --
And again, to confirm though, you didn't talk to anyone related to these violations other than Mr. Gruen, correct?
A That's correct.

Q Okay. With respect to SoCalGas's failure to produce Boots & Coots witnesses for an examination under oath, what did you review?

MR. GRUEN: I'm sorry, is there a particular area of testimony that you're asking about?

THE WITNESS: I think it must be back --

BY MR. STODDARD:

Q See page 55 if you need to.

A There are letters referenced in the footnotes 390 and 391.

Q So a letter from SED Director Malashenko and again another letter from SED Director Malashenko.

A Yes. Let's see if there's more.

On page 56 there is additional footnotes. And I did not see subpoenas, I did see correspondence.

Q You didn't see the subpoenas because they weren't included, or you didn't review them?

A I didn't review them.

Q In your practice as an attorney, have you ever propounded subpoenas on witnesses?

MR. GRUEN: I'm going to object to relevance here.

THE WITNESS: Not related to utilities.

BY MR. STODDARD:

Q In any context?
A A couple of times.
Q Have you ever provided a subpoena on another party to compel appearance of a third party?
A No.
MR. GRUEN: Same objection.
MR. STODDARD: I'm going to introduce Exhibit 1-32.
(Deposition Exhibit 1-32 was marked for identification and is attached hereto.)
BY MR. STODDARD:
Q Do you recognize this document, Ms. Felts?
A I think I've seen it before.
Q If you turn to page 56 of your testimony, you'll see this letter excerpted starting at the bottom of 56.
A Yes.
Q And continuing all through page 57 and 58.
A Yes. Right.
Q We would note that despite the liberal quotation, it excludes most of the discussion -- actually the entire discussion of law from the letter.
If you will reference page 3 of the letter

itself, Exhibit 132.
A Okay.
Q Do you see what --
Do you see that there the discussion of law starting with reference to Snyder v. Southern California Edison?
A Yes.
Q And you agree that that is not included in this testimony?
A Yes.
Q Do you recall reading this?
A I -- I read it. I didn't spend a lot of time on the law part.
Q But you considered it?
A Yes.
Q And do you agree that SoCalGas cannot legally compel appearance of a third party --
MR. GRUEN: Objection.
BY MR. STODDARD:
Q -- without legal process?
MR. GRUEN: Objection. Calls for legal conclusion.
You can answer if you're able.
THE WITNESS: My participation in this testimony is technical, not legal.

BY MR. STODDARD:

Q So you can't testify to the facts in this violation?

A To.

MR. GRUEN: Objection. Mischaracterization of testimony.

BY MR. STODDARD:

Q Are you able to testify to support this alleged violation?

A The violation is just as I read it, that you refused to produce a witness over a period of time when you were requested. That's factual. The argument underlying that is legal, and I did not develop that or spend any time reviewing it; so my part of the testimony is only on the facts.

Q But you have yourself prepared and served subpoenas, correct, for appearance of witnesses?

A Yes. I don't know how that is relevant in this particular contract that I have with the PUC.

Q Well, you're aware how subpoenas work?

A Yes.

Q Okay. And you've never, between --

To restate what you said earlier, you've never served a subpoena on a third party -- on a party for production of another party?

MR. GRUEN: Objection. Asked and answered.
THE WITNESS: No.
BY MR. STODDARD:
Q Do you believe it should be a violation of law if SoCalGas is compelled to do something that is not within its legal power to do?
MR. GRUEN: Objection. Calls for legal conclusion.
THE WITNESS: Yeah.
MR. GRUEN: I've got to say, this is -- it's --
We've been here cooperating, now it's going on the -- I think the eleventh hour, and now we're continuing to discuss calling for legal conclusion.
We agreed to come down here and do this deposition.
MR. STODDARD: You asked to come down here and do this deposition, it was your request.
MR. GRUEN: We agreed to do the deposition.
Let's not mince words. We agreed to do the deposition, but we're going on and on.
And we did not agree to come down here and provide Ms. Felts to answer questions that are calling for a legal conclusion. That's beyond the scope of what we've agreed to do here.
If we're going to keep going down this

road --

I think this line of questioning about legal conclusions and what her views are on the law should wrap up maybe in a question or two.

MR. STODDARD: Are you instructing the witness not to answer the question?

MR. GRUEN: No, she can answer. But the line of questioning is wasting our time.

MR. STODDARD: Darryl, we were happy to come to San Francisco, you guys wanted to do it down here.

We have a right to our deposition.

MR. GRUEN: That's --

MR. STODDARD: And she has asserted violations that -- a lot of them are based, frankly, on law. And the truth is, if she can't testify to those facts, we would ask for a witness.

MR. GRUEN: That is completely mischaracterizing what I'm saying.

I'm going to read for the record in light of this -- if you'll indulge me, we're going to have to go here, I hoped we wouldn't. But bear with me a second.

Can we go off the record for a second?

MR. STODDARD: Actually, in the interest of time, because I know we want to keep moving, can I

try restating the question and see if your objections continue?

MR. GRUEN: Of course.

MR. STODDARD: All right.

Q Are you aware of any authority that would permit SoCalGas to compel production of a third-party entity?

MR. GRUEN: I'm going to restate the objection and I'm going to note here that --

I'm going to read a quote from the pre-hearing conference statement, the transcript, at pages 43 and 44, that we -- that captures the understanding that we've had.

Unfortunately -- so this starts to quote ALJ Kenny.

"The next question concerns the deadline for SED to submit alleged violations and the factual and legal justifications for each alleged violation. My question is whether it would be reasonable to set a deadline of opening testimony for SED to submit alleged violations and the factual justifications for each alleged violation and set a deadline for

opening briefs for SED to submit the legal justifications for its alleged violation.

"Would any apparent like to respond to my question? SoCalGas."

Quoting Mr. Stoddard:

"SoCalGas's position on this is that SED should identify the alleged violations with specificity in its opening testimony sooner, if possible; but in its opening testimony would be acceptable to SoCalGas as we had proposed in our prehearing conference statement."

My co-counsel, Mr. Sher:

"Your Honor, SED would not necessarily be opposed to such if SoCalGas agreed that now that it would not waste time cross-examining SED's witness as to their legal basis for tying violations to code sections, et cetera."

"ALJ KELLEY: Does SoCalGas have a response at this time?

"MR. STODDARD: SoCalGas is not

1 going to waive any rights to
2 cross-examination. Although I would
3 ask for clarification what exactly is
4 meant by 'legal basis' here.
5 "MR. SHER: The way your Honor set
6 this out is that the violations would
7 be set forth in the opening. And then
8 the legal issues" --
9 I might highlight the legal issues there,
10 continuing the quote --
11 -- "would be discussed in the
12 briefing. To the degree it is
13 likely" -- "highly unlikely that SED's
14 witness would be a lawyer, so we don't
15 want SoCalGas, if we are going to do
16 this all in our opening testimony, to
17 cross-examine the witness as to their
18 legal basis for concluding that this
19 is a violation, for example 451.
20 "MR. STODDARD: SoCalGas does not
21 object to that."
22 Thank you.
23 It was SED's understanding that preparing
24 the violations at SoCalGas's request would not lead
25 to a set of questions of the witness as to the legal

analysis that would be required to support them underlying the testimony. These are briefable issues. That's why I'm recommending that we move on, we cut this line short.

If you want to continue with this line of questioning, we're here, but we maintain that this is a waste of time to do it here.

MR. STODDARD: An important part of that that you read was Nicholas's statement that your witness was not likely to be a lawyer, and it was -- part of it, what he said there was predicated upon that representation. First.

Second of all, this isn't cross-examination, this is discovery.

Third --

Can I see this?

-- this issue has been addressed before in front of the Commission. This is a transcript in which Ms. Felts was a witness in the PG&E San Bruno proceeding.

Are you familiar with this?

MR. GRUEN: I haven't seen the transcript that you're referring to. I don't know if I'm familiar or not. I'm sorry.

MR. STODDARD: Counsel for PG&E, Joe Malkin, was

representing -- was representing PG&E, and Bob Cagen was opening ORA. Bob Cagen stated an objection to a line of questioning related to Rule 1, said "Excuse me, Your Honor, I think I'm going to object to this. This really is calling for a legal conclusion rather than anything else that is valuable in the way of fact finding."

Joe Malkin said "Well, Your Honor, this witness has told us that she is advocating that the Commission find PG&E guilty of this Rule 1 violation. I am probing her thought process and what underlies her advocacy to the Commission. And to the extent that Mr. Cagen is concerned that we're sliding over into legal opinions, as you heard yesterday, Ms. Felts is, in fact, a lawyer; so the objection of a legal issue being addressed today by a non-lawyer, which was raised by Ms. Halogan yesterday, doesn't apply."

And the judge said "Okay. I'm going to allow it. Go ahead."

And the judge in this case was your co-counsel, Amy Yip-Kikugawa. And --

MR. GRUEN: Can I have an opportunity to respond to that?

MR. STODDARD: -- the discussion we had at the

pre-hearing conference was not reflected anywhere in the judge's scoping ruling.

Ms. Felts is asserting violations of law throughout her testimony. You had the ability to scope your testimony however you saw fit and you chose to do it that way. And you included law, but you also included conduct. And the question that we're asking relates to the connection of the conduct and the law.

MR. GRUEN: If I may.

I appreciate you raising the issues.

I will note that SoCalGas, in its response to our request to provide a person most knowledgeable related to the -- the SoCalGas's alleged assertions regarding Mr. Bruno. In response to our request for a deponent, we had understood that SoCalGas had only attorneys and argued that it couldn't provide someone on that basis was our understanding.

And when the ALJ ruled that, in fact, SoCalGas was to provide a non-attorney, SoCalGas continued to provide someone who is, in fact, an attorney. I understand he is not in that role as a represented counsel. However, Mr. Jason Egan, according to my last checking on the State Bar of California website yesterday, is indeed a licensed

attorney, and yet he is being provided to provide testimony in that deposition; so it's the same thing, yet our understanding, per the ruling, is he was provided as indeed a non-attorney in compliance with the ruling, similar to what we're doing here.

I understand there are a number of attorneys practicing for SoCalGas who I've had the ability to come in to work with who indeed are attorneys but don't appear or practice as designated counsel for SoCalGas. That's one.

Two, it remains our position that questions about discovery for purposes of this exercise are no different, are no different than cross-examination; so this line --

It is for the purpose -- to the extent this is for the purpose of determining cross-examination, we maintain there is no distinction. That's a distinction without a meaning.

We think that this --

We distinguish from San Bruno, this is its own set of facts and circumstances. We came to an agreement and understanding in reliance that SoCalGas on the record at the pre-hearing conference wanted SED to produce violations right away, and that we would have the ability to brief the violations. We

didn't have to do that, SED didn't have to produce violations.

There is no telling had we not come to this resolution what the ALJ would have instructed. But we've done so, and we are concerned that SoCalGas frankly is not in good faith in asking these questions at this time and asking for the basis for legal conclusion.

So with that, that's our response. That remains our position. It's not appropriate to be asking Ms. Felts these types of questions here.

But with that, you can continue with your line of questioning.

MR. STODDARD: I'd like to make a couple of other remarks for the record.

Frankly, I don't understand your point about Jason Egan, but we can move on from that.

Secondly, I don't know that it would be necessary to be asking Ms. Felts these questions if SED responded to our written discovery along the same lines, where we've asked you to explain legal basis and positions which SED should be capable of doing if it doesn't want to subject its witness to those questions.

One of the reasons for asking questions

related to legal basis or contentions or anything else is to help narrow the parties -- the scope of issues in dispute and bring the parties together for purposes of determining the issues that actually should be litigated in an evidentiary hearing.

Everything in here that has been alleged related to the Boots & Coots violation, is simply related to SED's misunderstanding of the law. And we are trying to ask questions about that so we can better understand what your position is.

MR. GRUEN: I'm going to object to that characterization as mischaracterizing SED's testimony. That's just simply an inappropriate mischaracterization.

I'm sorry if you don't understand our point about Mr. Egan, we can go back on the record and understand it. I don't know how to articulate it any better, Jack. I'm sorry that it has to come to this.

But we're here. If you want to continue to ask questions, we --

Again, we don't think this is appropriate to continue down the road of asking about legal conclusion, but if you're going to do it for purposes of the deposition, then continue with your line.

MR. STODDARD: I hadn't finished what I was

1 saying, but I will continue my line of questioning in
2 a moment.
3 The next --
4 The only other thing I wanted to mention,
5 just in case it was unclear, was we aren't conceding
6 anything with respect to cross-examination. I was
7 simply noting that this is not a cross-examination.
8 Again, our reading of what occurred -- you
9 know, our reading of ALJ Amy Yip-Kikugawa's ruling at
10 the San Bruno case we think is applicable here. We
11 don't think that the judge relied on that discussion
12 for purposes of the scoping ruling. And if we have
13 to go to the judge over this, we can.
14 MR. GRUEN: We're agreeing to answer questions.
15 I would say it's also a mischaracterization
16 to call Amy Yip-Kikugawa my co-counsel. She is an
17 Assistant General Counsel at -- and she is my direct
18 supervisor. She is not an assigned counsel to this
19 proceeding.
20 Just to make it clear, that's Nicholas and
21 myself. We're the designated counsel of record, just
22 to clarify.
23 And the ruling there has, to my -- and you
24 can enlighten me, there has been no ruling saying
25 that Ms. Felts has to answer questions regarding

legal conclusions, that call for legal conclusion. But if you want to take that to the judge, we understand, and we can handle the issue that way.

Like I said, she is available to answer questions at this point.

MR. STODDARD: Okay.

Q Turning to page 54, Ms. Felts.

A Okay. I'll get it later.

MR. GRUEN: Okay.

BY MR. STODDARD:

Q This alleges four violations related to alleged data dumps of documents on Blade.

A Yes.

Q Did you review the contents of these data dumps?

A I have reviewed some of it, but I have not reviewed the actual files that Blade received. I believe I have reviewed some of the documents that were in possession of the PUC that were similar.

Q And you didn't interview Blade regarding the context of the data dumps, did you?

A No.

Q Did you review any correspondence between SoCalGas and SED on this issue, including data responses?

A On this issue?
Q Yes.
A What data response would it be, could you tell me?
Q We can follow up with that.
But do you recall as you sit here, reviewing a response to a data dump?
A I think I did review some things, but I can't tell you what data response it was in or what the extent of the documentation was.
Q Okay. For purposes of the record, it looks like I didn't actually get an answer to my question prior to the exchange with Mr. Gruen; so I'm going to ask it again, and we can just get it on the record.
Are you aware of any authority that would permit SoCalGas to compel production of a third-party entity?
MR. GRUEN: And re-note the objection as calling for legal conclusion.
THE WITNESS: No.
MR. STODDARD: Thank you.
Q With respect to the Blade data dump we were just discussing, you indicated you may have reviewed some of the documents?
A Yes.

Q Did you assess materiality of the documents to Blade's RCR report?

A I don't know what that means.

Q Did you consider whether or not the documents had bearing on any of the issues that Blade reached conclusions on in their Blade -- in the Blade report?

A I think I answered that question when I discussed the apparent lack of temperature surveys or their -- the fact that they appeared not to have them until review for Well SS-25. Other than that --

And they said they didn't have permeability of the reservoir, which wasn't in the Well 25 -- SS-25 file anyway. I would say that most of their conclusions were based on their own work with the well and their own investigation into the well casings, their groundwater monitoring wells.

So they developed most of their own -- their own information. It's possible that had they had the time to look at all of the data that SoCalGas provided them, they might have had additional information to inform them on more details of the case. I just don't know.

Q Thank you.

When did you review the data doc -- data

dump documents that you reviewed?

A I didn't -- I didn't review anything other than that one well file prior to filing the testimony.

Is that what you mean? I mean, you're talking about SoCalGas records?

Q Yes.

A Yes.

Q Ms. Felts, circling back to the privilege violations, and if we don't -- if we have to reference the testimony, we can. But we can speak without a document if we're able to.

You're aware that each alleged privilege violation is framed as both a violation of 451 and 1.1, correct?

A Yes.

Q Can you explain why in your view each privilege violation is -- constitutes a violation of Public Utilities Code 451?

MR. GRUEN: Objection. Calls for legal conclusion.

Can we go off the record for a second?

MR. STODDARD: You've stated your objections, Darryl.

MR. GRUEN: I know.

MR. STODDARD: Are you going to let us ask her a question?

MR. GRUEN: Absolutely.

We have --

MR. STODDARD: We can go off the record.

MR. MOSHFEGH: There is a question pending.

THE VIDEOGRAPHER: Just a moment.

MR. GRUEN: Okay. We can wait until the question is done.

THE VIDEOGRAPHER: Go ahead.

THE WITNESS: Okay. 451 is related to safety, so a duty to operate safely. Is that --

Do you want more?

BY MR. STODDARD:

Q So did you determine that the documents here that were withheld jeopardized safety?

A The concept was that you -- the delay in getting the documents created an unsafe situation because there was no way to respond to the documents without -- or to use the documents unless they were provided.

Q Would it be relevant to your opinion on these violations if --

I asked earlier several if several of the documents were duplicates, as you'll recall.

Would it be relevant to your opinion on these violations if many of these documents were already in SED's possession?

A I -- I have to wonder why we don't have them, what the purpose of not disclosing them is. If we already have them, why couldn't you just tell us we already have them.

Q For example, attachments to emails that would have been otherwise privileged, attachments to privileged documents are privileged, but they're included for purposes of the calculation of penalties.

A Is that how they ended up being pages?

Q Is that relevant in your view to the assessment of a violation in this instance?

A I think it's probably relevant. You have to have all of the information in order to count.

MR. GRUEN: If you finished that line, can we go off the record now for a moment?

BY MR. STODDARD:

Q Do you know what, if anything, SED would have done differently had it received these documents earlier?

A You might not have that violation.

Q Do you know what, if anything, SED would

have done differently with respect to their investigation?

A Not without knowing what the -- what the records are.

Q The records that were produced to you, which are in your possession, these are the documents that the privilege violations are based upon.

A Oh, and that have now been produced?

Q Yes.

A Without looking at each one of the documents, I can't tell you what --

I was never asked to look at them in that manner.

Q Are you aware if any of the documents are relied upon in your testimony in any citation or exhibit for purposes of supporting other alleged violations?

A I don't know. But I don't think so.

MR. STODDARD: Okay. Thank you. We can go off the record.

THE VIDEOGRAPHER: We are off the record at 7:42 p.m.

(Off the record.)

THE VIDEOGRAPHER: We are back on the record at 8:06 p.m.

MR. STODDARD: All right, Ms. Felts, I'm going to promise to keep this short hopefully. But we'll be jumping around a bit just because this is kind of the scraps at the end, so bear with me.

Q To begin with, I'm going to ask, do you consider yourself, Ms. Felts, an expert on attorney-client privilege?

A No.

Q Are you aware of any hard drive of Blade data that was produced to SED?

A Yes.

Q And have you accessed that?

A No.

Q So you haven't reviewed any of the records that are on that drive?

A Not yet.

MR. STODDARD: Okay. I'm going to introduce Exhibit 1-33.

(Deposition Exhibit 1-33 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q Do you recognize this document, Ms. Felts?

A Yeah, it looks like something I wrote.

Q This is an email from you --

Well, to be clear this includes two emails: The top one is from you to Karen Shea and Darryl Gruen, and it includes an attachment "Draft Data Request"; is that correct?

A Yes. Well, that's what it looks like.

Q And the bottom email is also from you to Karen Shea, and it appears to be related to the draft data request as well?

A Yes.

Q Turning the page, in referencing the attached data request, and again, this is just for purposes of the record, Exhibit 1-33, the email dated November 8, 2019, and the draft data request, the first data request is for -- it asks to provide a summary of all data requests that SoCalGas has received related to I1906016, including those received from the CPUC before and after the initiation of investigation from DOGGR Blade and third parties; is that correct?

A Yes.

Q Did you prepare that request?

A Yes.

Q Why did you prepare that request?

A At the time I understood that the data that was available at the PUC was incomplete, an

incomplete set, and it was also not readily accessible to me. And so there was some discussion back and forth about how to get a full set of data.

Q And was it not --

Was it incomplete and not accessible in part because of the corrupted files you referenced earlier?

A That's part of the issue. Things wouldn't open. Other issues were there was some thought that some of the data that had been provided by SoCalGas in thumb drives may not have been uploaded. I don't think that was the case.

But at the time -- at the time when I couldn't find it on the Diamond database, that was mentioned that they thought maybe, maybe they weren't uploaded.

Later I found out that it was just organized a different way, and I was able to find some of it. Did not solve the corrupted files problem.

Q Was any of the data lost, to your knowledge?

A What do you mean by "lost"? Like did they lose a thumb drive?

Q Or was it, you know, simply not in SED's possession despite the fact that it appeared it had been transmitted to SED?

A I can't really tell you that. I don't have a good feel for what came in, what should have been uploaded and what should not have. I just don't have a good solid sense of what all SoCalGas provided. And I wanted to get it directly from SoCalGas again, but apparently you said no; so then we took steps to try to get a set of data from -- directly from Blade, and that was difficult too.

Q In the course of preparing this request, I imagine you had conversations with Ms. Shea and Mr. Gruen about the need to ask it?

A Yes.

Q Including discussions about how you could access the data, correct?

A Yes.

Q And where it was?

A Yes.

Q In the course of those discussions, did anyone indicate that the data had been lost?

A There was a thought that -- not that it had been lost but that maybe it was not uploaded. There was also a comment that the thumb drives had been uploaded and then discarded. Because we thought maybe if we could get the thumb drives, I could look at it directly from those. But I have not been

provided any thumb drives.

Q Why couldn't you --

If it had been uploaded from the thumb drives, why couldn't you look at the data that was uploaded?

A Well, because the files weren't opening. And a lot of the larger files were opening with the message that said the file was corrupted; so there wasn't any way for me to recover it.

Q Do you recall from those discussions any reference to FTP transfers?

A We talked about this earlier. I had --

I got capability to do FTP out, but there was no discussion about --

Q I'm sorry, I'm asking a different question.

A Okay.

Q We did talk about it earlier, correct?

A Yes.

Q I'm asking whether --

You mentioned that SED had received files from SoCalGas via thumb drive?

A Yes.

Q Are you aware whether SED also received files from SoCalGas via FTP?

A No.

Q Okay. So you don't recall any discussion about expired FTP transmittals?

A I think somebody --

Actually, I think I received a link maybe from Karen or Darryl that had expired. I tried the link.

Q Thank you.

Ms. Felts, we were discussing casing inspection logs earlier.

Do you have any personal experience with the Vertilog tool?

A Other than just reading logs? No.

You mean like running a wire line test or -- and generating one?

No.

Q How about interpreting logs --

A Yes.

Q -- Vertilogs specifically?

A I have read those, yes.

Q And in what context?

A Well, beginning in school I had a whole course on that, and then over a period of time I have had occasion in private consulting cases to look at well logs.

Q Again, we're talking specifically about

Vertilog logs here.

A Well, I think a Vertilog is one of many different kinds of logs; so I'm sure I've looked at them. I just can't tell you exactly which case, what date.

Q And what is your understanding regarding the reliability of Vertilogs -- the Vertilog tool?

A There were probably some issues with them over time. They've probably gotten a lot better recently.

Q Okay.

MR. STODDARD: Introduce Exhibit 1-34.

(Deposition Exhibit 1-34 was marked for identification and is attached hereto.)

BY MR. STODDARD:

Q In connection with Exhibits 1-17 and 1-18. Ms. Felts, do you recognize this?

A No.

Q This is the metadata file for an email for the document attached to the Tuesday, November 19th, email from Darryl to you, if you reference Exhibit 1-17 and Exhibit 1-18.

A 1-17 and 1-18?

Q Correct.

Do you have 1-18 there?
A I have 1-18.
Is that good enough?
Q That's good enough.
A Okay.
Q This is the metadata file for document 1-18, which is the draft testimony that was transmitted to you by Darryl Gruen, and this is SED's portion of the testimony.
A Okay.
Q And you'll see there that identifies the manager author as Randy Holter.
A Uh-huh.
Q And you don't know and haven't spoken to Randy Holter, correct?
A No.
Q And the secondary author it identifies, last modified -- the document was last modified by Darryl Gruen.
Do you see that?
A Yes.
Q And it doesn't identify any other authors?
A Okay.
Q Do you see that?
A Uh-huh.

Q Ms. Felts, seeing this and having gone through the preparation of your testimony in the period of time between the engagement and the service of your testimony, do you think it would make more sense for Mr. Holter to be the testifying witness on some of these issues than you?

A I have no idea. I don't know what his expertise is. And I don't know that he actually wrote the testimony. He could have just opened the file on 10-19 or 11-19 or whenever it was created. I guess it was created sometime around 9-23 maybe.

Q And --

A Hard to tell.

Q And if he just opened the document, then that would mean Mr. Gruen drafted the testimony based on this metadata; is that correct?

A No, not --

I mean, metadata, this only goes to this electronic file; so the file could be saved as another document, as a new document. You could start over.

I don't -- I don't know that you can really glean a whole lot by this particular metadata.

Q Ms. Felts, with respect to your portion of the testimony, which is related to the recordkeeping

violations --

MR. GRUEN: Objection. That's a mischaracterization of testimony.

She has identified that she is sponsoring the whole -- the entirety of the testimony, not just recordkeeping.

MR. STODDARD: I'm sorry, let me correct that.

Q With respect to the portion of the testimony that you wrote, which relates to the recordkeeping violations, Ms. Felts, what is your experience with recordkeeping practices at gas storage fields?

A Only that I reviewed records for the Playa del Rey and the Montebello cases.

Q So you haven't looked at recordkeeping practices at other gas storage fields?

A No. I only looked at the recordkeeping entries in the PG&E records retention documents. I think I provide those to you in response to a data request.

Q And aside from that, nothing else?

A No.

MR. STODDARD: Okay. I think that's it.

THE WITNESS: Do you want to redirect?

MR. GRUEN: I just want to be sure.

MR. STODDARD: Apologies.

One more document.
MR. GRUEN: Okay.
(Deposition Exhibit 1-35 was marked for identification and is attached hereto.)
MR. STODDARD: Mark this as Exhibit 1-35.
Q Ms. Felts, do you recognize this document?
A I don't think I've seen this document.
Q You did indicate that you accessed the Commission's Aliso Canyon Web page, correct, but you had trouble downloading a Blade report from there, I think?
A Yes.
Q Do you see down about three-quarters of the way down the page --
A Okay.
Q -- where it says "Both the Division," I guess at the bottom, both "The Division and the PUC have directed the Gas Company to hire an independent third party to perform a technical root cause analysis of the well failure"?
A Yes.
Q Is it your understanding from your review that Blade's investigation has been fully independent?

A Yes.
Q Turning to Appendix B, do you see on page 1 the "Findings and Timeline"?
A Yes.
Q Do you see there in the first sentence of last paragraph where it states "SED will release its official investigation report upon completion of all aspects of its investigation"?
A Yes.
Q And to confirm, you're not aware of any such official investigation report; is that correct?
A Wasn't -- doesn't --
Isn't that related to the Blade report?
Q This is SED's report.
A Okay. I guess I misread that.
Q Are you aware of an SED official investigation report?
A No.
Q Okay.
MR. GRUEN: I just note a foundation objection for the record.
She has noted that she hasn't seen this document before, she doesn't recognize it.
But the questions are noted.
MR. STODDARD: All right. That's it.

MR. GRUEN: Okay.
MR. STODDARD: Go off the record?
MR. GRUEN: Yeah.
MR. STODDARD: Do you have any other comments?
MR. GRUEN: Yeah. I'll wait until we're off.
THE VIDEOGRAPHER: We are off the record at 8:27 p.m.
(Off the record.)
THE VIDEOGRAPHER: We are back on the record at 8:31 p.m.
MR. GRUEN: While we were off the record, SoCalGas and SED agreed that Ms. Felts can offer a clarification statement for her earlier testimony today. And if so SoCalGas wants to ask follow-up questions on that statement, SED has no objection.
Go ahead.
THE WITNESS: Okay. Do you want me to just say what it is?
MR. GRUEN: Yeah.
THE WITNESS: That one?
MR. GRUEN: Yeah.
THE WITNESS: Well, so you asked me about my contractor license earlier, and I looked it up, and it is called -- in California it's called an a general engineering contractor license.

So when I said general engineering license, I think maybe I misspoke and didn't add the "contractor" on. But somehow it was misunderstood. I just wanted to clarify that.

I have put that on inactive, and apparently in the last couple of years privacy must have gotten to the contractor -- the state license board because you can no longer look it up under my name if it's inactive; So some old -- an old license number when I was incorporated comes up under Invictus as not -- not inactive, but it's actually a dead license.

The current one that is inactive, I would have to provide you the license number, and I don't have it with me. But I could do that if you want it. And then I think it will come up maybe.

MR. STODDARD: Okay.

THE WITNESS: But I think I could get those records if you needed them.

MR. STODDARD: Yes, we would appreciate that.

Well, actually let me ask one quick question.

Q What is the purpose of the general engineering contractor's license?

A It's basically the top tier of general contractors license. It basically gives me license

in California to do any kind of construction on contracts.

Q And to subcontract?

A And subcontract. So a general --

Like if you go hire a general contractor to build a building, that would be me. Then I subcontract all of the work out and handle all of the permits and oversight; so it is a major category. It's the category if you want to be into construction.

I acquired it early on to be able to drill wells for groundwater monitoring and to be able to do hazardous waste cleanup. I did have to take an additional exam for the hazardous part of it; so mine says "A General Engineering Contractor-HAZ," which means I'm allowed to manage site cleanups where there is hazardous waste.

Q Okay. Yes, I think we would like to see copies of that --

A Okay.

Q -- license.

And just to reiterate, because I was confused about this earlier, but -- and I want to make sure I have it clear, and I apologize if I already asked this question.

Do you have any other engineering-related licenses or certifications or credentials?

MR. GRUEN: That she hasn't already identified in the course of the deposition today?

MR. STODDARD: Well, I just want to be clear that we're not --

I might be confused.

For sake of the record, we now have established and I understand the general engineering contractor's license.

Q Are there any others?

A No.

MR. STODDARD: Okay.

MR. MOSHFEGH: Confirm for one --

MR. STODDARD: Sure.

I don't think we necessarily need to. I --

Housekeeping item for purposes of the record.

We've noted that you've objected today to questions related to Ms. Felts' work since the service of opening testimony?

MR. GRUEN: Right.

MR. STODDARD: We don't -- we don't have those documents. Sounds like there might be additional work product being generated at this time; we don't

1 have access to that.
2 We are going to see her live testimony at
3 some point in time, which presumably will be based on
4 that work product and given that that's basis of the
5 objection, so, procedurally, we would like to keep
6 the deposition open, and the request for work papers
7 in particular open so that after the next round of
8 testimony is served, you would then produce to us any
9 additional work papers.
10 MR. GRUEN: I think it's appropriate for a
11 second -- if you want to produce --
12 If you want a deposition that is based on,
13 then it's appropriate to do a new round.
14 This was understood to be a notice of
15 deposition related to opening testimony. You know,
16 you're entitled to propound discovery.
17 MR. STODDARD: We can notice a new deposition
18 with the understanding that this is -- you know, it
19 would be based on that objection, essentially.
20 MR. GRUEN: Yeah. And, you know, we'll bear it
21 in mind.
22 But I will say, Jack, we're -- the timelines
23 grow tighter. We're noting that the reply testimony
24 is due February 21st, rebuttal is the 27th of March.
25 The ability for us, with our limited bandwidth, to

1 juggle that additional deposition time with the
2 ability to prepare testimony and do discovery is
3 getting harder; so we just ask that you bear that in
4 mind.
5 But we understand the request and if you
6 want to request the -- we anticipate that you may
7 want to request the work papers associated with
8 future testimony as well. And we'll bear that in
9 mind and work to cooperate on that discovery along
10 those lines.
11 MR. STODDARD: Yeah.
12 Just to be clear, we wouldn't be requesting
13 a deposition prior to your service of testimony --
14 MR. GRUEN: Understood. We appreciate that.
15 Yeah. Okay.
16 MR. STODDARD: -- unless we get new information
17 related to her testimony that wasn't produced today
18 that you produce at a later date that is relevant
19 to -- right, with that one caveat in mind.
20 But assuming when we're talking about the
21 work papers for purposes of the reply testimony, our
22 reservation for an additional deposition would be
23 after the service of the reply testimony.
24 MR. GRUEN: And we have the same concern with
25 rebuttal, of course, that immediately before rebuttal

testimony, we'll be busy in preparing that as well, the March 27th testimony.

MR. STODDARD: Right.

MR. GRUEN: Okay. Sounds like we can work that out okay.

MR. STODDARD: Anything further?

MR. GRUEN: Nothing further from SED.

Thank you.

THE VIDEOGRAPHER: This is the end of our deposition, the end of disk number five, Volume number 1, of the deposition of Margaret Felts on February 5th of the year 2020.

We are off the record at 8:39 p.m.

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REPORTER'S DEPOSITION TIME LOG:
REPORTER - LINDA SILVER RYAN
DATE - Wednesday, February 5, 2020, 2019
WITNESS - MARGARET FELTS

ATTORNEY	ON RECORD	OFF RECORD	TOTAL
STODDARD	9:23 A.M.	10:55 A.M.	1:32
	11:13 A.M.	12:15 P.M.	1:02
	1:24 P.M.	2:30 P.M.	1:06
	2:47 P.M.	3:39 P.M.	0:52
	3:44 P.M.	3:52 P.M.	0:08
	4:25 P.M.	5:59 P.M.	1:34
	6:22 P.M.	7:42 P.M.	6:03
	8:06 P.M.	8:27 P.M.	0:21
	8:31 P.M.	8:39 P.M.	0:08
		TOTAL USED:	9:04

CHANGES AND SIGNATURE

WITNESS: MARGARET FELTS

DATE OF DEPOSITION: Wednesday, February 5, 2020

PAGE	LINE	CHANGE	REASON

SED SUR_REPLY_001141

STATE OF _____)
) Ss.
COUNTY OF _____)

I, the undersigned, say that I have read the foregoing deposition, and I declare, under penalty of perjury under the laws of the State of _____, that the foregoing is a true and correct transcript of my testimony contained therein, incorporating any and all changes and/or corrections as heretofore noted by me, and the reasons for same.

EXECUTED this _____ day of _____, 2020, at _____.

_____
MARGARET FELTS

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify:

That the foregoing proceedings were taken before me at the time and place herein set forth;

That any witnesses in the foregoing proceedings, prior to testifying, were placed under oath;

That a verbatim record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction;

That the foregoing deposition is a full, true and correct transcript of my shorthand notes so taken and transcribed;

That any dismantling of this transcript will void my certification as a Certified Shorthand Reporter;

I further certify that I am neither financially interested in the action nor a relative or employee of any attorney of any of the parties.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: _____

_____
LINDA SILVER RYAN
CSR No. 9915

A

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Response to Data Request

Response to SED Data Request-72

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 72 related to hydrogeology, ground water and cathodic protection from Reply Testimony of Mr. Tim Hower and Mr. Charlie Stinson on behalf of SoCalGas.

Date:
Jun. 10, 2020

Version:
1

Project Number:
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Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	Jun. 10, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

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1 **Background** **4**

2 **Questions and Responses** **5**

2.1 Question 1 5

2.2 Question 2 6

3 **References** **7**

1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on April 10, 2020. Data Request No: SED 72 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED Data Request 72 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The questions are related to the document titled: *Chapter I, Prepared Reply Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on behalf of Southern California Gas Company (U 904 G)* (file name: "1_Ch. I - MHA - Hower and Stinson (A Final).pdf").

2 Questions and Responses

2.1 Question 1

1. Please refer to page 22, which states, "Knowledge of the hydrogeology and groundwater is only relevant for the design and implementation of the surface casing."

2.1.1 Blade Responses

a. Does Blade agree with this?

No.

b. If not, why not?

The SS-25 well was completed with a single-barrier architecture, which relied on the pressure integrity of the production casing. In single-barrier wells, the failure of the production casing will necessarily result in the loss of integrity of the well, as happened in the 2015 SS-25 incident. The corrosion resulting from groundwater outside the production casing represented a threat to the integrity of the production casing. In addition, many of the Aliso Canyon wells had uncemented production casing in the vicinity of the groundwater. It is therefore essential for the operator to have a knowledge and understanding of the groundwater regime.

c. Does Blade accept as true that knowledge of hydrogeology and groundwater is irrelevant for operations and maintenance of:

a. The production casing that is at the same depth and covered by the surface casing?

No.

Since the surface casing cannot be relied on (or independently inspected) to maintain its integrity, it cannot be relied on to exclude groundwater from the outside of the production casing. Therefore, knowledge of groundwater behavior is essential for the production casing above the surface casing shoe as described in the response to Question 1 b. above.

b. The production casing that is at lower depths and not covered by the surface casing?

No.

In this case, production casing is adjacent to any groundwater and annulus fluid below the surface casing shoe, and the knowledge of the groundwater regime is essential as described in the response to Question 1 b. above. If cement is absent, then the groundwater and production casing are in direct contact.

c. Explain.

Explanations are included the previous responses to Questions 1.

2.2 Question 2

2. Please refer to the Section entitled, "Cathodic Protection is not Industry Standard and Was Not Necessary for SS-25." on pages 25 through 27.

2.2.1 Blade Responses

a. In particular, does Blade agree with SoCalGas's conclusion in this section that states, "Thus, an independent corrosion protection mechanism like cathodic protection would not have been useful in this case, contrary to the suggestions made in SED testimony."

   Yes. Blade agrees with the conclusion.

   Cathodic protection could have prevented the surface casing corrosion that provided additional pathways for the gas. However, cathodic protection could not have prevented the 7 in. external corrosion and subsequent rupture. This is discussed in Page 215 of the Blade Main report.

b. Why or why not?

   The production casing inside the surface casing from surface to 990 feet in SS-25, could not be protected with cathodic protection. The production casing is inside the surface casing in this region, consequently any cathodic currents would have been shielded by the surface casing and not reached the production casing. A cathodic protection system would have impressed a current and ensured that the surface casing that was exposed to the soil and surface formations, would have been protected while acting as a cathode. The 7 in. casing was inside the 11 3/4 in. casing and would not act as the cathode in such a system.

c. Provide reference to text as necessary to support the answer to questions 2a and 2b.

   This is discussed in Page 215 of the Blade Main report.

d. In Blade's view, could cathodic protection have helped protect the surface casing and production casing of well SS-25?

   No, only the surface casing could be protected and the corrosion mitigated using a cathodic protection system. The production casing inside the surface casing cannot be protected using a cathodic protection system.

e. Why or why not?

   See response to Question 2 b.

f. Provide reference to text as necessary to support the answer to questions 2a and 2b.

   The surface casing cathodic protection is discussed in Page 233 of the Blade Main Report.

g. Provide any additional context Blade deems necessary to support the answers provided.

   NACE International provides guidance on the application of cathodic protection for external surfaces of steel well casings [1]. The standard applies only to well casing exteriors and not to internal corrosion.

3 References

[1] NACE International, "Application of Cathodic Protection for External Surfaces of Steel Well Casings (NACE SP0186-007)," 2007.

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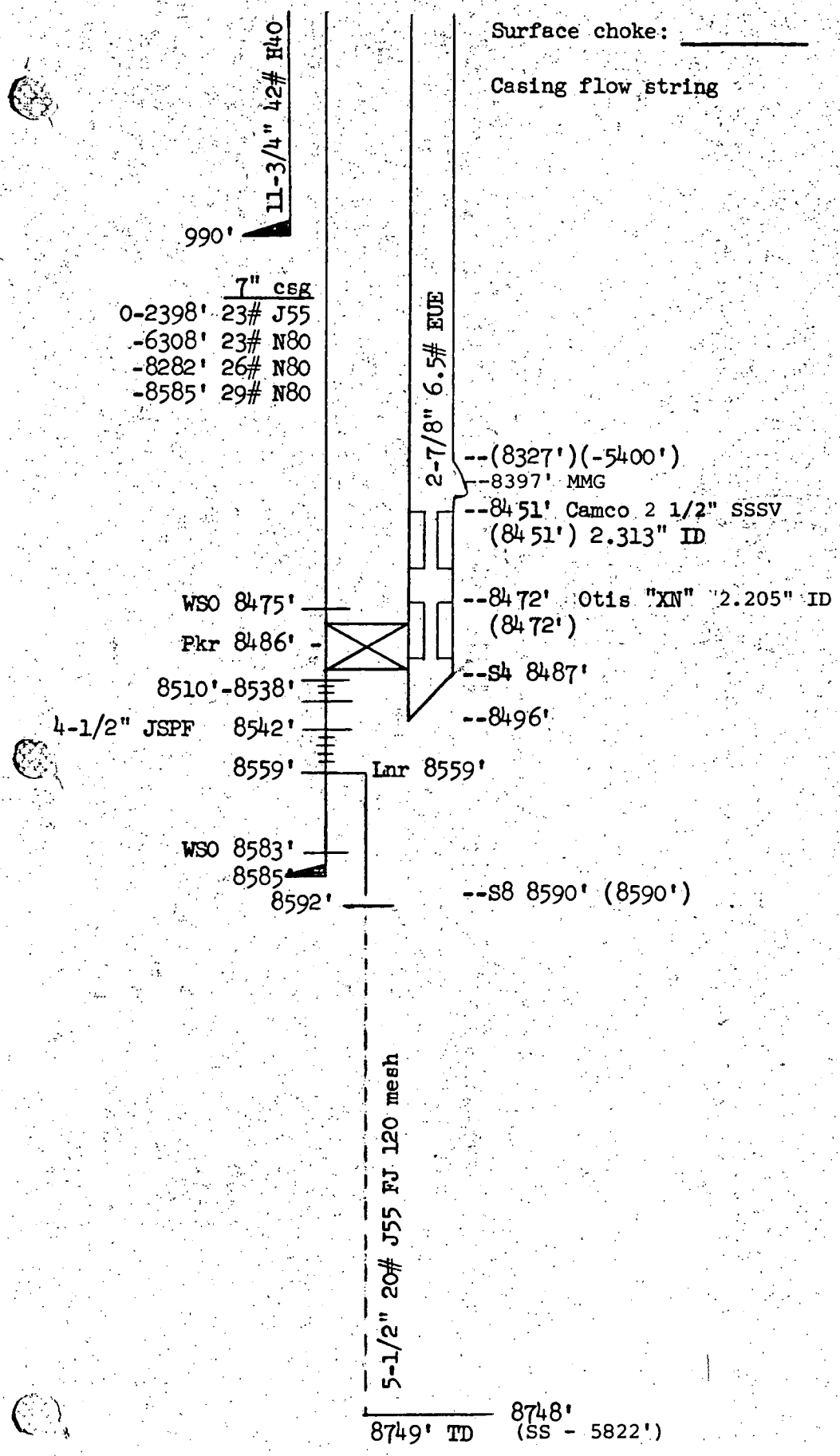
3 References

[1] NACE International, "Application of Cathodic Protection for External Surfaces of Steel Well Casings (NACE SP0186-007)," 2007.

Elevation: 927"
DF: 6'

Standard Sesnon 25



Surface choke: _____

Casing flow string

10/1/53 - Well spud
2/25/54 - Well completed
893' of 4-1/2" drill pipe + Johnston tester side tracked - old TD 4948' plugged back 3860'
5/24/73 - 6/6/73 Cleaned out to 8748', pressure tested csg, perforated for conversion to gas storage, ran tbg with gas lift valves
6/25/76 - 7/9/76 Cleaned out to 8748', ran tbg with SSSV
2/16/79-2/20/79 Replaced safety system

NOTE: Unable to use lower nipple - use M-lock for SSSV nipple. See wire-line tickets.

WELL VOLUME

	Cu.Ft.	Bbl.
Tubing	276	49
Csg/Lnr.	37	7
Annulus	1469	262

6/12/84

SED SUR_REPLY_001209

AC_CPUC_SED_DR_30_0000778

The Gas Company℠

Interoffice Memo

To: R. C. Wiegman

From: P. D. Yu

Date: February 20, 1992

Subject:

Well FF-34A Cathodic Protection

Storage Operations recommends the installation of cathodic protection in well FF-34A at an estimated cost of $25,000 to $30,000. Storage Operations has provided the necessary funds for this project in its 1992 budget and the Division is requested to oversee the installation as soon as it is operationally feasible.

Cathodic protection is recommended for this well in light of our discoveries of external casing corrosion during the workover in July of 1991. Metal loss averaging approximately 15% was indicated over the interval of 1000' to 4000' and the hole in the casing was discovered at 2104'. The cost of installing and maintaining the cathodic protection is minimal when compared to the potential cost ($400,000) of a workover should problems develop in the future.

Please inform me when a completion data for this project is anticipated. If you have any questions, do not hesitate to ask.

RDO:sw:FF34A

cc: R. D. Phillips

WELL HISTORY FILE

SED SUR_REPLY_001210

AC_CPUC_0022178

The table below is supplied by Southern California Gas Company on the first and third Friday of each month as required by Order No. 1109. This table contains additional information than is displayed on the Division's Tests Results of Aliso Canyon Wells Website.
Terminology used in the status column is different than what is used on the Division's web page. Users should refer to the Division's map and table to gauge Southern California Gas Company's progress in complying with Order No. 1109.

Well Name	API Number	Noise/Temp			DOGGR Approval	Ultrasonic (USIT)			Magnetic Flux (CsgInsp)			Cement Bond Log (CBL)			Multi-Arm Caliper (MAC)			Block Test	DOGGR Approval	Annulus / Tubing Test	DOGGR Approval	Other	Current Status
SIMP Wells Assessed	Number	Ran Date	Submitted Date	Submitted By	Approval Date	Ran Date	Submitted Date	Submitted By	Ran Date	Submitted Date	Submitted By	Ran Date	Submitted Date	Submitted By	Ran Date	Submitted Date	Submitted By	Test Date	Approval Date	Test Date	Approval Date	Comments	Status
Fernando Fee 32	03700686	03/08/16	03/11/16	Azra Kargar	03/18/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32A	03721872	03/08/16	03/11/16	Azra Kargar	03/18/16	03/30/16	05/06/16	AJ Alshammasi	04/01/16	07/15/16	AJ Alshammasi	03/30/16	04/07/16	Jovy Kroh	09/01/16	09/08/16	AJ Alshammasi	04/04/16	09/16/16	09/07/16	09/16/16		Passed All Tests
Fernando Fee 32B	03721358	03/09/16	03/11/16	Azra Kargar	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32C	03721359	03/09/16	03/11/16	Azra Kargar	Failed N/T	10/11/16	10/18/16	AJ Alshammasi	05/26/16	06/09/16	AJ Alshammasi	10/11/16	10/18/16	AJ Alshammasi	10/08/16	10/18/16	AJ Alshammasi	10/07/16		10/20/16		Rig	Pending Test Results
Fernando Fee 32D	03721356	03/10/16	03/11/16	Azra Kargar	05/10/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32E	03721321	09/22/16	10/04/16	AJ Alshammasi	10/07/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32F	03721313	09/22/16	09/27/16	AJ Alshammasi	10/05/16	07/19/16	07/21/16	AJ Alshammasi				07/19/16	07/26/16	AJ Alshammasi	07/21/16	07/21/16	AJ Alshammasi	07/22/16	10/05/16	09/17/16	10/05/16		Passed All Tests
Fernando Fee 32G	03730374	04/04/16	04/11/16	AJ Alshammasi	05/03/16	09/18/14	07/26/16	AJ Alshammasi	07/28/16	08/09/16	AJ Alshammasi									08/03/16	09/28/16		Passed All Tests
Fernando Fee 32H	03730456	04/04/16	04/07/16	AJ Alshammasi	04/08/16	07/26/15	08/02/16	AJ Alshammasi	07/26/16	08/09/16	AJ Alshammasi									08/03/16	09/28/16		Passed All Tests
Fernando Fee 33	03700687	04/04/16	04/05/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 34A	03722044	03/09/16	03/11/16	Azra Kargar	05/03/16																	Rig	Taken Out of Operation (Plugged & Isolated)
Fernando Fee 34BR	03722302	03/09/16	03/11/16	Azra Kargar	03/18/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35A	03721457	03/21/16	03/22/16	AJ Alshammasi	03/28/16	08/18/16	08/24/16	AJ Alshammasi	08/12/16	08/24/16	AJ Alshammasi	08/18/16	08/24/16	AJ Alshammasi	08/13/16	08/24/16	AJ Alshammasi	08/19/16	09/13/16	09/12/16	09/13/16		Passed All Tests
Fernando Fee 35B	03721458	03/22/16	03/23/16	AJ Alshammasi	03/28/16				07/14/16	08/02/16	AJ Alshammasi												Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35C	03721279	03/11/16	03/14/16	Azra Kargar	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35D	03721453	03/22/16	03/24/16	AJ Alshammasi	03/28/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35E	03721278	04/04/16	04/05/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 38A	03724230	03/11/16	03/17/16	Azra Kargar	03/28/16	05/11/16	05/13/16	AJ Alshammasi	05/04/16	06/08/16	AJ Alshammasi	05/01/16	05/17/16	AJ Alshammasi	05/04/16	05/24/16	AJ Alshammasi	05/07/16	06/14/16	06/02/16	06/14/16		Passed All Tests
Fernando Fee 38B	03724231	03/11/16	03/15/16	Azra Kargar	03/18/16	04/16/16	05/06/16	AJ Alshammasi	04/18/16	05/17/16	AJ Alshammasi	04/16/16	04/16/16	AJ Alshammasi	04/18/16	05/17/16	AJ Alshammasi	04/19/16	06/14/16	04/28/16	06/14/16		Passed All Tests
Fernando Fee 38C	03724232	03/10/16	03/17/16	Azra Kargar	03/18/16	03/22/16	06/09/16	AJ Alshammasi	03/23/16	07/07/16	AJ Alshammasi	03/22/16	03/28/16	Jovy Kroh	03/23/16	06/21/16	AJ Alshammasi	03/25/16	07/08/16	04/12/16	07/08/16		Passed All Tests
Frew 2	03700665	06/10/16	06/14/16	AJ Alshammasi	06/20/16																		Taken Out of Operation (Plugged & Isolated)
Frew 4	03700667	04/08/16	04/13/16	AJ Alshammasi	04/19/16																	Rig	Taken Out of Operation (Plugged & Isolated)
Frew 5	03700668	09/15/16	10/14/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Frew 6	03700669	04/08/16	04/13/16	AJ Alshammasi	04/19/16																		Taken Out of Operation (Plugged & Isolated)
Frew 7	03700670	06/08/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Frew 8	03700671	03/25/16	03/28/16	AJ Alshammasi	03/31/16																		Taken Out of Operation (Plugged & Isolated)
Mission Adrian 1A	03721891	03/22/16	03/24/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Mission Adrian 1B	03721892	09/19/16	10/05/16	AJ Alshammasi	10/07/16																		Taken Out of Operation (Plugged & Isolated)
Mission Adrian 3	03700693	03/05/16	04/07/16	AJ Alshammasi	04/08/16	08/17/16	09/08/16	AJ Alshammasi				08/06/16	09/08/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 12	03700701	09/28/16	10/14/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Porter 24A	03724143	03/23/16	03/24/16	AJ Alshammasi	05/03/16	09/23/16	10/03/16	AJ Alshammasi	09/21/16	10/03/16	AJ Alshammasi	09/23/16	10/03/16	AJ Alshammasi	09/21/16	10/03/16	AJ Alshammasi	09/17/16	10/13/16	10/11/16	10/13/16		Passed All Tests
Porter 24B	03724144	03/23/16	03/24/16	AJ Alshammasi	05/03/16	05/19/16	05/23/16	AJ Alshammasi	05/16/16	06/25/16	AJ Alshammasi	05/19/16	05/23/16	AJ Alshammasi	05/16/16	06/25/16	AJ Alshammasi	07/14/16	07/29/16	07/22/16	07/29/16		Passed All Tests
Porter 25R	03700712	04/12/16	04/14/16	AJ Alshammasi	04/08/16	04/29/16	05/06/16	AJ Alshammasi	04/28/16	05/17/16	AJ Alshammasi	04/29/16	05/17/16	AJ Alshammasi	04/28/16	05/06/16	AJ Alshammasi	04/27/16	05/18/16	05/13/16	05/18/16		Passed All Tests
Porter 26	03700713	03/17/16	03/21/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Porter 26A	03721362	10/03/16	10/14/16	AJ Alshammasi		08/10/16	08/24/16	AJ Alshammasi	08/05/16	08/24/16	AJ Alshammasi	08/10/16	08/24/16	AJ Alshammasi	08/31/16	09/08/16	AJ Alshammasi	08/19/16					Taken Out of Operation (Plugged & Isolated)
Porter 26B	03721357	03/21/16	03/22/16	AJ Alshammasi	06/07/16																		Taken Out of Operation (Plugged & Isolated)
Porter 26C	03721353	03/31/16	04/05/16	AJ Alshammasi	04/07/16				07/11/16	07/21/16	AJ Alshammasi				07/09/16	07/21/16	AJ Alshammasi	10/10/16				Rig	Pending Test Results
Porter 26D	03721320	03/18/16	03/21/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Porter 26E	03721319	10/03/16	10/17/16	AJ Alshammasi					08/31/16						09/01/16								Taken Out of Operation (Plugged & Isolated)
Porter 30	03700717	03/29/16	03/30/16	AJ Alshammasi	04/01/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32	03700719	03/23/16	03/24/16	AJ Alshammasi	05/03/16	10/18/16	10/20/16	AJ Alshammasi				10/18/16	10/20/16	AJ Alshammasi								Rig	Pending Test Results
Porter 32A	03721277	03/23/16	03/24/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32B	03721276	03/24/16	03/27/16	AJ Alshammasi	05/12/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32C	03721360	03/25/16	03/28/16	AJ Alshammasi	05/12/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32D	03721355	03/28/16	03/30/16	AJ Alshammasi	05/19/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32E	03721363	03/28/16	03/30/16	AJ Alshammasi	05/19/16							09/20/16	10/18/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 32F	03721354	03/24/16	03/27/16	AJ Alshammasi	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Porter 34	03700721	03/28/16	03/29/16	AJ Alshammasi	03/30/16																		Taken Out of Operation (Plugged & Isolated)
Porter 35	03700722	04/07/16	04/11/16	AJ Alshammasi	05/23/16	01/23/16	03/08/16	Jovy Kroh	02/26/16	03/08/16	Jovy Kroh	01/23/16	03/08/16	Jovy Kroh	02/26/16	06/21/16	AJ Alshammasi			03/01/16			Taken Out of Operation (Plugged & Isolated)
Porter 36	03700723	06/01/16	06/06/16	AJ Alshammasi	06/20/16	01/19/16	06/21/16	AJ Alshammasi				01/19/16	03/10/16	Jovy Kroh	01/25/16	06/21/16	AJ Alshammasi	01/21/16		02/01/16			Taken Out of Operation (Plugged & Isolated)
Porter 37	03700724	03/29/16	03/30/16	AJ Alshammasi	06/07/16																		Taken Out of Operation (Plugged & Isolated)
Porter 37A	03722046	03/28/16	03/29/16	AJ Alshammasi	03/30/16																	Rig	Pending Test Results
Porter 38	03700725	03/18/16	03/21/16	Azra Kargar	10/11/16																		Taken Out of Operation (Plugged & Isolated)
Porter 39	03700726	04/05/16	04/07/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Porter 40	03700727	04/05/16	04/07/16	AJ Alshammasi	04/08/16							08/12/16	09/08/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 42A	03721876	03/24/16	03/28/16	AJ Alshammasi	03/31/16							09/22/16	10/18/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 42B	03721877	03/31/16	04/05/16	AJ Alshammasi	04/07/16	05/20/16	06/21/16	AJ Alshammasi	05/25/20	06/13/16	AJ Alshammasi	05/26/16	06/05/16	AJ Alshammasi	05/25/16	06/13/12	AJ Alshammasi	05/27/16					Taken Out of Operation (Plugged & Isolated)
Porter 42C	03721878	03/24/16	03/28/16	AJ Alshammasi	03/31/16																	Rig	Taken Out of Operation (Plugged & Isolated)
Porter 44	03700731	04/19/16	04/20/16	AJ Alshammasi	05/19/16	02/29/16	03/07/16	Jovy Kroh	02/15/16	03/07/16	Jovy Kroh	02/16/16	03/07/16	Jovy Kroh	02/25/16	03/07/16	Jovy Kroh	02/18/16	03/14/16	03/14/16	04/12/16		Passed All Tests
Porter 45	03700732	03/29/16	03/30/16	AJ Alshammasi	04/01/16																		Taken Out of Operation (Plugged & Isolated)
Porter 46	03700733	04/12/16	04/15/16	AJ Alshammasi	05/23/16																		Taken Out of Operation (Plugged & Isolated)
Porter 47	03700734	03/29/16	03/30/16	AJ Alshammasi	04/01/16																		Taken Out of Operation (Plugged & Isolated)

Porter 50B	03724336	03/08/16	03/11/16	Azra Kargar	05/03/16	04/14/16	05/06/16	AJ Alshammasi	04/16/16	05/17/16	AJ Alshammasi	04/14/16	05/17/16	AJ Alshammasi	04/15/16	05/06/16	AJ Alshammasi	04/18/16	06/09/16	04/29/16	06/09/16		Passed All Tests
Porter 50C	03724337	03/08/16	03/11/16	Azra Kargar	03/18/16	03/16/16	05/06/16	AJ Alshammasi	03/17/16	03/20/16	AJ Alshammasi	03/16/16	03/20/16	AJ Alshammasi	03/17/16	03/21/16	Jovy Kroh	03/20/16	04/20/16	04/06/16	04/20/16		Passed All Tests
Porter 68A	03722742	03/10/16	03/11/16	Azra Kargar	03/17/16	05/24/16	06/05/16	AJ Alshammasi	05/26/16	06/05/16	AJ Alshammasi	05/24/16	06/05/16	AJ Alshammasi	05/25/16	06/08/16	AJ Alshammasi	05/21/16	06/28/16	06/10/16	06/28/16		Passed All Tests
Porter 68B	03724136	03/31/16	04/05/16	AJ Alshammasi	04/07/16	04/13/16	05/06/16	AJ Alshammasi	04/14/16	05/17/16	AJ Alshammasi	04/16/16	05/17/16	AJ Alshammasi	04/14/16	05/06/16	AJ Alshammasi	04/15/16	06/02/16	04/25/16	06/02/16		Passed All Tests
Porter 69A	03722051	03/14/16	03/17/16	Azra Kargar	03/17/16																		Taken Out of Operation (Plugged & Isolated)
Porter 69B	03724127	03/14/16	03/17/16	Azra Kargar	03/17/16	04/05/16	05/06/16	AJ Alshammasi	04/04/16	05/17/16	AJ Alshammasi	04/05/16	05/17/16	AJ Alshammasi	04/04/16	05/11/16	AJ Alshammasi	04/06/16	06/10/16	04/19/16	06/10/16		Passed All Tests
Porter 69C	03724128	03/15/16	03/17/16	Azra Kargar	03/17/16	07/15/16	07/21/16	AJ Alshammasi	07/09/16	07/21/16	AJ Alshammasi	07/15/16	07/21/16	AJ Alshammasi	07/08/16	07/21/16	AJ Alshammasi	07/11/16	08/03/16	07/27/16	08/03/16		Passed All Tests
Porter 69D	03724130	03/20/16	03/22/16	AJ Alshammasi	03/24/16	05/24/16	06/03/16	AJ Alshammasi	05/21/16	06/05/16	AJ Alshammasi	05/24/16	06/05/16	AJ Alshammasi	06/10/16	06/14/16	AJ Alshammasi	05/20/16	06/14/16	06/08/16	06/14/16		Passed All Tests
Porter 69E	03724138	03/16/16	03/21/16	Azra Kargar	05/03/16	09/07/16	09/19/16	AJ Alshammasi	08/31/16	09/08/16	AJ Alshammasi	09/07/16	09/19/16	AJ Alshammasi	09/01/16	09/08/16	AJ Alshammasi	09/02/16	10/03/16	09/20/16	10/03/16		Passed All Tests
Porter 69F	03724226	03/16/16	03/21/16	Azra Kargar	03/22/16	05/07/16	05/17/16	AJ Alshammasi	04/06/16	06/30/16	AJ Alshammasi	04/07/16	05/17/16	AJ Alshammasi	04/06/16	05/17/16	AJ Alshammasi	04/08/16	06/30/16	04/22/16	06/30/16		Passed All Tests
Porter 69G	03724225	03/14/16	03/17/16	Azra Kargar	03/17/16	08/08/16	08/24/16	AJ Alshammasi	08/03/16	08/24/16	AJ Alshammasi	08/08/16	08/24/16	AJ Alshammasi	08/04/16	08/24/16	AJ Alshammasi	08/05/16	08/31/16	08/18/16	08/31/16		Passed All Tests
Porter 69H	03724223	03/17/16	03/21/16	Azra Kargar	05/04/16	06/11/16	06/14/16	AJ Alshammasi	06/17/16	06/23/16	AJ Alshammasi	06/11/16	06/14/16	AJ Alshammasi	06/13/16	06/23/16	AJ Alshammasi	06/09/16	07/05/16	06/22/16	07/05/16		Passed All Tests
Porter 69J	03724224	04/23/16	04/25/16	AJ Alshammasi	06/10/16	03/31/16	05/06/16	AJ Alshammasi	03/31/16	05/17/16	AJ Alshammasi	03/31/16	05/17/16	AJ Alshammasi	04/02/16	05/11/16	AJ Alshammasi	04/05/16	06/20/16	04/29/16	06/20/16		Passed All Tests
Porter 69K	03724236	03/20/16	03/22/16	AJ Alshammasi	05/04/16	05/22/16	05/24/16	AJ Alshammasi	05/24/16	06/09/16	AJ Alshammasi	05/22/16	05/24/16	AJ Alshammasi	05/24/16	06/09/16	AJ Alshammasi	05/18/16	07/08/16	07/07/16	07/08/16		Passed All Tests
Porter 72A	03724145	03/11/16	03/15/16	Azra Kargar	04/04/16	05/18/16	05/24/16	AJ Alshammasi	05/19/16	06/13/16	AJ Alshammasi	05/18/16	05/24/16	AJ Alshammasi	05/19/16	06/13/16	AJ Alshammasi	05/14/16	08/30/16	08/29/16	08/30/16		Passed All Tests
Porter 72B	03724146	03/21/16	03/23/16	AJ Alshammasi	05/04/16	06/28/16	07/07/16	AJ Alshammasi	06/29/16	07/07/16	AJ Alshammasi	06/28/16	07/07/16	AJ Alshammasi	06/29/16	07/07/16	AJ Alshammasi	06/24/16	08/08/16	08/04/16	08/08/16		Passed All Tests
Porter Sesnon 42	03700753	04/19/16	04/21/16	AJ Alshammasi	06/08/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 1	03700647	09/20/16	10/07/16	AJ Alshammasi	10/07/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 2	03700648	09/27/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 3	03700649	04/21/16	04/23/16	AJ Alshammasi	05/06/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 4	03700650	04/11/16	04/13/16	AJ Alshammasi	04/19/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 5	03700651	04/18/16	04/21/16	AJ Alshammasi	07/08/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 6	03700652	09/27/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 7	03700653	07/13/16	07/18/16	AJ Alshammasi	07/29/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 8	03700654	04/25/16	04/27/16	AJ Alshammasi	06/07/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 02	03700755	06/07/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 03H	03700756	06/09/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 04	03700757	04/14/16	04/19/16	AJ Alshammasi	06/08/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 04A	03721375	04/18/16	04/19/16	AJ Alshammasi	05/09/16													09/19/16					Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 04B	03730460	09/10/16	09/12/16	AJ Alshammasi	09/13/16	08/15/16	08/25/16	AJ Alshammasi	08/19/16	08/25/16	AJ Alshammasi	08/15/16	08/25/16	AJ Alshammasi	08/17/16	08/25/16	AJ Alshammasi	08/23/16	09/08/16	09/02/16	09/08/16		Passed All Tests
Standard Sesnon 04-O	03722063	04/23/16	04/26/16	AJ Alshammasi	05/19/16										09/16/16								Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 05	03700758	04/19/16	04/19/16	AJ Alshammasi	05/03/16																	Rig	Pending Test Results
Standard Sesnon 06	03700759	04/21/16	04/23/16	AJ Alshammasi	05/06/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 09	03700762	06/06/16	06/08/16	AJ Alshammasi	06/14/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 10	03700040	06/02/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 11	03700763	04/13/16	04/14/16	AJ Alshammasi	05/24/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 12	03700764	04/20/16	04/23/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 13	03700765	04/06/16	04/11/16	AJ Alshammasi	04/11/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 14	03700766	09/23/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 16	03700768	04/06/16	04/11/16	AJ Alshammasi	04/11/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 17	03700769	09/19/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 24	03700775	04/13/16	04/14/16	AJ Alshammasi	05/24/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 25	03700776	04/08/16																					Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 25A	03721322	07/24/16	07/27/16	AJ Alshammasi	07/29/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 25B	03721323	07/24/16	07/27/16	AJ Alshammasi	07/29/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 29	03700041	06/09/16	06/11/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 30	03700780	09/29/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 31	03700781	04/06/16	04/07/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 44A	03721455	04/13/16	04/14/16	AJ Alshammasi	05/24/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 44B	03721361	04/14/16	04/19/16	AJ Alshammasi	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Ward 3	03700192	04/01/16	04/05/16	AJ Alshammasi	Failed N/T	09/02/16	09/19/16	AJ Alshammasi				07/11/16										Rig	Taken Out of Operation (Plugged & Isolated)
Ward 3A	03722306	04/01/16	04/05/16	AJ Alshammasi	04/07/16																		Taken Out of Operation (Plugged & Isolated)

N/T Total # Submittals=	113
N/T Total # Approved=	102
N/T Total # Ran=	114
N/T Total # Failure=	2
Failure due to Temp=	0
Failure due to Noise=	0
USIT Total # Submittals=	36
USIT Total # Ran=	36
CsgInsp Total # Submittals=	33
CsgInsp Total # Ran=	34
CBL Total # Submittals=	36
CBL Total # Ran=	37
Caliper Total # Submittals=	32
Caliper Total # Ran=	34
Block Test Total # Tests=	32
Block Test Total # Approvals=	26
A/T Test Total # Tests=	31
A/T Test Total # Approvals=	28
Total # Passed All Tests=	28
Total # Pending Test Results=	5
Total # Plugged and Abandoned=	0
Total # Taken Out of Operation=	81

Current Rig	Current Well	Next Well (Plan)	Move Date (Plan)
Ensign 333	Porter 50A	TBD	TBD
Ensign 334	Frew 4	Standard Sesnon 4-O	October 25, 2016
Ensign 335	Fernando Fee 32C	Fernando Fee 32B	October 22, 2016
Ensign 341	Standard Sesnon 5	Fernando Fee 35C	November 1, 2016
Ensign 342	Porter 26C	Porter 26A	October 30, 2016
Ensign 343	Fernando Fee 34A	Fernando Fee 34BR	November 15, 2016
Ensign 346	Porter 32	Porter 32B	November 7, 2016
Ensign 347	Porter 42C	TBD	December 1, 2016
Rival 6	Porter 37A	TBD	November 10, 2016
Rival 15	Ward 3	Ward 3A	December 15, 2016
Total # of Rigs	**10**		

Western Wireline

Multi-finger Imaging Caliper Log (24 MAC)

Company	Southern California Gas Company		
Well	Standard Sesnon 25		
Field	Aliso Canyon		
County	Los Angeles		
State	California	Country	U.S.A.

Company: Southern California Gas Company
Well: Standard Sesnon 25
Field: Aliso Canyon
County: Los Angeles
State: California — Country: U.S.A.

Location: API #: 0203700776
Lat: 34.315083 Long: -118.564069
GIS Source: GPS Datum: 83
SEC 28 TWP 03N RGE 16W

Other Services: None

Permanent Datum	Ground Level	Elevation	2927
Log Measured From	D.F. of 6 ft		
Drilling Measured From	D.F.		

Elevation: K.B. / D.F. 2933 / G.L. 2927

Date	21-Jan-2016
Run Number	One
Depth Driller	N/A
Depth Logger	Not Tagged
Bottom Logged Interval	6000
Top Log Interval	3000
Open Hole Size	N/A
Type Fluid	Mixed
Density / Viscosity	N/A
Max. Recorded Temp.	Not Recorded
Estimated Cement Top	N/A
Time Well Ready	10:30 A.M.
Time Logger on Bottom	13:30 P.M.
Equipment Number	306
Location	Ventura
Recorded By	D.A. Hall
Witnessed By	No Witness

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				2.875	6.4	Surface	?

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	11.75	42.0 H40	Surface	990
Prot. String	7.0	23.0 J55, 23.0 N80	Surface	8585
Production String		26.0 N80, 29.0 N80		
Liner	5.5	20.0 J55	8559	8749

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All interpretations are opinions based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions set out in our current Price Schedule.

Comments

Correlated depth to a Western Wireline Temperature/Noise log dated 11-9-2015

Log Variables

DatabaseC:\Users\Allen\Desktop\Socal Gas Logs\Socalgas Logs 1-21-2016\socalgas ss25_1-21-2
Dataset field/well/run1/Main/_vars_

Top - Bottom

BOREID in	BOTTEMP degF	CASEID in	CASEOD in	CASETHCK in	MinAPIWall in	PERFS	SRFTEMP degF
7	150	2.441	2.875	0.217	0.178	0	63

TDEPTH ft
8378

Variable Description

BOREID : Borehole I.D.
BOTTEMP : Bottom Hole Temperature
CASEID : Casing I.D.
CASEOD : Casing O.D.
CASETHCK : Casing Thickness
MinAPIWall : Minimum API Wall Thickness
PERFS : Perforation Flag
SRFTEMP : Surface Temperature
TDEPTH : Total Depth

Western Wireline — Main Logging Section

5" = 100'

Database File: c:\users\allen\desktop\socal gas logs\socalgas logs 1-21-2016\socalgas ss25_1-21-2016_24mac.db
Dataset Pathname: Main
Presentation Format: aera combined 24 arm calipireric practice
Dataset Creation: Fri Jan 22 17:03:01 2016
Charted by: Depth in Feet scaled 1:240

LTEN (lb) 3000 | 100 LSPD (ft/min) -100 | 1.941 IDAVC (in) 2.941 | 1.941 IDMNC (in) 2.941 | 1.941 IDMXC (in) 2.941 | NOM ID 1.941 (in) 2.941 | Caliper 0.8 (in) 1.8 | MIN REM WALL 0 (in) 0.5 | 0 NOMTHK (in) 0.5 | High Side 22.875 | Low Side 22.875 | CCLC 00.5 | PTANN

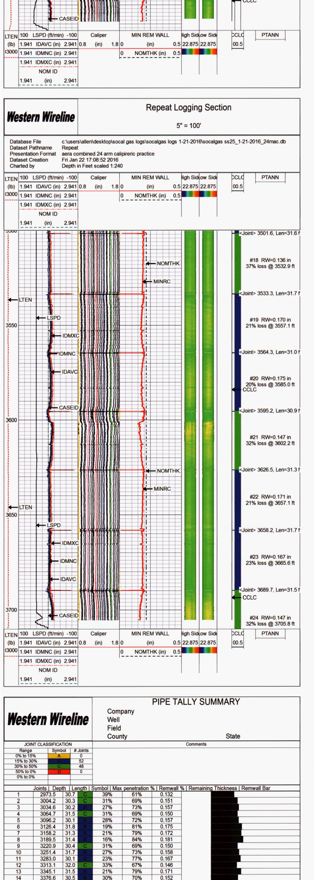
LTEN (lb) 3000 | 100 LSPD (ft/min) -100 | 1.941 IDAVC (in) 2.941 | 1.941 IDMNC (in) 2.941 | 1.941 IDMXC (in) 2.941 | NOM ID 1.941 (in) 2.941 | Caliper 0.8 (in) 1.8 | MIN REM WALL 0 (in) 0.5 | 0 NOMTHK (in) 0.5 | High Side 22.875 | Low Side 22.875 | CCLC 00.5 | PTANN

Western Wireline — Repeat Logging Section

5" = 100'

Database File: c:\users\allen\desktop\socal gas logs\socalgas logs 1-21-2016\socalgas ss25_1-21-2016_24mac.db
Dataset Pathname: Repeat
Presentation Format: aera combined 24 arm calipireric practice
Dataset Creation: Fri Jan 22 17:08:52 2016
Charted by: Depth in Feet scaled 1:240

LTEN (lb) 3000 | 100 LSPD (ft/min) -100 | 1.941 IDAVC (in) 2.941 | 1.941 IDMNC (in) 2.941 | 1.941 IDMXC (in) 2.941 | NOM ID 1.941 (in) 2.941 | Caliper 0.8 (in) 1.8 | MIN REM WALL 0 (in) 0.5 | 0 NOMTHK (in) 0.5 | High Side 22.875 | Low Side 22.875 | CCLC 00.5 | PTANN



LTEN (lb) 3000 | 100 LSPD (ft/min) -100 | 1.941 IDAVC (in) 2.941 | 1.941 IDMNC (in) 2.941 | 1.941 IDMXC (in) 2.941 | NOM ID 1.941 (in) 2.941 | Caliper 0.8 (in) 1.8 | MIN REM WALL 0 (in) 0.5 | 0 NOMTHK (in) 0.5 | High Side 22.875 | Low Side 22.875 | CCLC 00.5 | PTANN

Western Wireline — PIPE TALLY SUMMARY

Company / Well / Field / County / State

JOINT CLASSIFICATION

Range	Symbol	# Joints
0% to 15%	A	0
15% to 30%	B	52
30% to 50%	C	48
50% to 0%	D	0
0% to 0%		

Comments

Joints	Depth	Length	Symbol	Max penetration %	Remwall %	Remaining Thickness	Remwall Bar
1	2973.5	30.7	C	39%	61%	0.132	
2	3004.2	30.3	C	31%	69%	0.151	
3	3034.6	30.2	B	27%	73%	0.157	
4	3064.7	31.5	C	31%	69%	0.150	
5	3096.2	30.1	B	28%	72%	0.157	
6	3126.4	31.8	B	19%	81%	0.175	
7	3158.2	31.3	B	21%	79%	0.172	
8	3189.5	31.4	B	16%	84%	0.181	
9	3220.9	30.4	C	31%	69%	0.150	
10	3251.4	31.7	B	27%	73%	0.158	
11	3283.0	30.1	B	23%	77%	0.167	
12	3313.1	32.0	C	33%	67%	0.146	
13	3345.1	31.5	B	21%	79%	0.171	
14	3376.6	30.5	C	30%	70%	0.152	
15	3407.1	32.3	C	32%	68%	0.148	
16	3439.4	30.5	B	22%	78%	0.170	
17	3469.9	31.6	B	20%	80%	0.173	
18	3501.6	31.7	C	37%	63%	0.136	
19	3533.3	31.0	B	21%	79%	0.170	
20	3564.3	30.9	B	20%	80%	0.175	
21	3595.2	31.3	C	32%	68%	0.147	
22	3626.5	31.7	B	21%	79%	0.171	
23	3658.2	31.5	B	23%	77%	0.167	
24	3689.7	32.4	C	32%	68%	0.147	
25	3722.0	31.6	B	21%	79%	0.172	
26	3753.7	30.8	B	25%	75%	0.164	
27	3784.5	31.9	C	30%	70%	0.151	
28	3816.4	31.9	B	23%	77%	0.168	
29	3848.3	30.9	B	25%	75%	0.162	
30	3879.2	30.3	B	27%	73%	0.159	

Sheet: 1 of 4 — Log Date:

Western Wireline — PIPE TALLY SUMMARY

Company / Well / Field / County / State

JOINT CLASSIFICATION

Range	Symbol	# Joints
0% to 15%	A	0
15% to 30%	B	52
30% to 50%	C	48
50% to 0%	D	0
0% to 0%		

Comments

Joints	Depth	Length	Symbol	Max penetration %	Remwall %	Remaining Thickness	Remwall Bar
31	3909.5	31.6	C	31%	69%	0.151	
32	3941.1	31.5	C	30%	70%	0.152	
33	3972.6	31.6	B	19%	81%	0.176	
34	4004.2	30.4	B	28%	72%	0.157	
35	4034.6	31.1	B	22%	78%	0.169	
36	4065.7	31.7	B	28%	72%	0.155	
37	4097.4	30.6	B	26%	74%	0.160	
38	4128.1	31.5	C	34%	66%	0.144	
39	4159.6	31.2	C	36%	64%	0.138	
40	4190.8	30.8	B	27%	73%	0.157	
41	4221.6	31.8	C	32%	68%	0.148	
42	4253.4	32.3	C	31%	69%	0.149	
43	4285.7	31.1	C	33%	67%	0.144	
44	4316.9	32.1	C	33%	67%	0.146	
45	4348.9	30.3	C	38%	62%	0.135	
46	4379.2	29.4	C	32%	68%	0.147	
47	4408.6	31.2	B	25%	75%	0.163	
48	4439.8	31.5	B	24%	76%	0.164	
49	4471.3	30.3	B	27%	73%	0.159	
50	4501.6	32.2	C	30%	70%	0.153	
51	4533.8	30.6	C	34%	66%	0.144	
52	4564.5	29.8	C	36%	64%	0.138	
53	4594.3	31.5	C	30%	70%	0.152	
54	4625.7	31.0	B	27%	73%	0.159	
55	4656.8	30.2	B	27%	73%	0.159	
56	4687.0	30.9	B	24%	76%	0.164	
57	4717.9	31.3	B	27%	73%	0.158	
58	4749.1	31.3	C	30%	70%	0.151	
59	4780.4	31.5	C	30%	70%	0.152	
60	4811.9	31.5	C	31%	69%	0.150	

Sheet: 2 of 4 — Log Date:

Western Wireline — PIPE TALLY SUMMARY

Company / Well / Field / County / State

JOINT CLASSIFICATION

Range	Symbol	# Joints
0% to 15%	A	0
15% to 30%	B	52
30% to 50%	C	48
50% to 0%	D	0
0% to 0%		

Comments

Joints	Depth	Length	Symbol	Max penetration %	Remwall %	Remaining Thickness	Remwall Bar
61	4843.4	30.7	B	25%	75%	0.163	
62	4874.1	31.6	C	32%	68%	0.148	
63	4905.7	28.3	C	30%	70%	0.152	
64	4934.1	31.8	B	28%	72%	0.155	
65	4965.9	30.9	C	31%	69%	0.150	
66	4996.8	31.4	C	31%	69%	0.150	
67	5028.1	30.8	B	28%	72%	0.155	
68	5058.9	31.4	B	28%	72%	0.156	
69	5090.2	31.1	C	30%	70%	0.151	
70	5121.3	31.9	C	31%	69%	0.149	
71	5153.2	30.2	B	28%	72%	0.157	
72	5183.4	32.1	C	34%	66%	0.142	
73	5215.5	29.6	C	30%	70%	0.151	
74	5245.1	31.4	C	32%	68%	0.149	
75	5276.4	31.4	C	30%	70%	0.152	
76	5307.8	31.3	C	32%	68%	0.148	
77	5339.1	31.9	C	38%	62%	0.134	
78	5371.1	27.8	C	30%	70%	0.151	
79	5398.8	32.1	C	32%	68%	0.147	
80	5430.9	29.5	C	31%	69%	0.150	
81	5460.4	31.7	C	32%	68%	0.147	
82	5492.1	30.2	B	29%	71%	0.154	
83	5522.3	31.6	C	31%	69%	0.150	
84	5553.9	30.1	B	27%	73%	0.159	
85	5584.0	31.6	C	31%	69%	0.150	
86	5615.6	28.9	B	28%	72%	0.157	
87	5644.5	31.2	C	31%	69%	0.151	
88	5675.7	29.8	C	33%	67%	0.146	
89	5705.6	31.4	C	32%	68%	0.148	
90	5736.9	31.5	C	30%	70%	0.152	

Sheet: 3 of 4 — Log Date:

Western Wireline — PIPE TALLY SUMMARY

Company / Well / Field / County / State

JOINT CLASSIFICATION

Range	Symbol	# Joints
0% to 15%	A	0
15% to 30%	B	52
30% to 50%	C	48
50% to 0%	D	0
0% to 0%		

Comments

Joints	Depth	Length	Symbol	Max penetration %	Remwall %	Remaining Thickness	Remwall Bar
91	5768.4	31.6	C	31%	69%	0.150	
92	5800.1	27.8	B	28%	72%	0.156	
93	5827.8	30.9	B	27%	73%	0.158	
94	5858.8	31.6	C	31%	69%	0.149	
95	5890.3	30.4	B	27%	73%	0.157	
96	5920.7	31.6	C	33%	67%	0.145	
97	5952.3	31.9	C	34%	66%	0.143	
98	5984.2	31.3	B	29%	71%	0.153	
99	6015.6	31.3	C	31%	69%	0.151	
100	6046.8	29.1	B	29%	71%	0.154	
101	6076.0	0.0				0.000	

Sheet: 4 of 4 — Log Date:

Calibration Report

Database File: C:\Users\Allen\Desktop\Socal Gas Logs\Socalgas Logs 1-21-2016\socalgas ss25_1-21-2016_24mac.db
Dataset Pathname: Main
Dataset Creation: Fri Jan 22 17:03:01 2016

24 Arm Multi Sensor Caliper Calibration Report

Serial Number: 13060148
Tool Model: 24
Performed: Fri Jan 22 16:03:25 2016

Ref ID:	1.78	2.36	2.99	3.46	4.02	in
Arm1	1111.00	1374.00	1782.00	2138.00	2634.00	in
Arm2	934.00	1211.00	1643.00	2034.00	2584.00	in
Arm3	877.00	1119.00	1516.00	1882.00	2408.00	in
Arm4	908.00	1160.00	1568.00	1942.00	2471.00	in
Arm5	850.00	1100.00	1507.00	1887.00	2425.00	in
Arm6	1012.00	1290.00	1716.00	2109.00	2649.00	in
Arm7	928.00	1197.00	1618.00	2006.00	2549.00	in
Arm8	891.00	1153.00	1568.00	1961.00	2509.00	in
Arm9	887.00	1147.00	1558.00	1951.00	2500.00	in
Arm10	1083.00	1350.00	1742.00	2105.00	2608.00	in
Arm11	942.00	1210.00	1626.00	2025.00	2582.00	in
Arm12	1018.00	1310.00	1746.00	2152.00	2709.00	in
Arm13	1006.00	1278.00	1698.00	2094.00	2644.00	in
Arm14	972.00	1247.00	1668.00	2062.00	2614.00	in
Arm15	1086.00	1401.00	1864.00	2281.00	2856.00	in
Arm16	997.00	1272.00	1694.00	2080.00	2625.00	in
Arm17	1002.00	1296.00	1749.00	2161.00	2727.00	in
Arm18	1026.00	1287.00	1680.00	2030.00	2526.00	in
Arm19	1163.00	1464.00	1916.00	2314.00	2868.00	in
Arm20	937.00	1209.00	1644.00	2034.00	2591.00	in
Arm21	978.00	1269.00	1720.00	2124.00	2694.00	in
Arm22	919.00	1177.00	1589.00	1958.00	2484.00	in
Arm23	907.00	1172.00	1601.00	1983.00	2534.00	in
Arm24	927.00	1186.00	1599.00	1969.00	2499.00	in

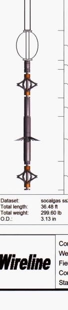
HWWSMFC verifications Calibration Report

	Pre Verification	Post Verification	Casing Check	
Performed:	Fri Jan 22 11:52:16 2016	Wed Jan 20 14:44:52 2016	Mon Sep 21 11:56:07 2015	
Ref ID:	2.36	2.36	0.00	in
Min.	2.39	2.31	0.00	in
Max.	2.39	2.35	0.00	in
Avg.	2.39	2.33	0.00	in
Dia1	2.39	2.34	4.92	in
Dia2	2.39	2.34	4.92	in
Dia3	2.39	2.35	4.92	in
Dia4	2.39	2.34	4.92	in
Dia5	2.39	2.34	4.92	in
Dia6	2.39	2.33	4.92	in
Dia7	2.39	2.33	4.92	in
Dia8	2.39	2.33	4.92	in
Dia9	2.39	2.33	4.92	in
Dia10	2.39	2.34	4.92	in
Dia11	2.39	2.31	4.93	in
Dia12	2.39	2.33	4.92	in

Inclinometer Calibration Report

Performed: Fri May 22 12:17:47 2015

	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	0.00	2231.00	-1.00	1.00	gee
Y Accelerometer	0.00	2100.00	-1.00	1.00	gee
Z Accelerometer					gee

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
			CHD-STNDRD Standard Cable Head	1.00	1.44	5.00
			CENT-CSS1x2TP Computer Sonics Top Bow Spring	2.92	3.13	20.00
			SBAR-169x5 Sinker Bar 1 11/16 by 5 foot	5.00	1.69	60.00
			SBAR-169x5 Sinker Bar 1 11/16 by 5 foot	5.00	1.69	60.00
			SBAR-1.69 1 11/16 Titan Tungsten Bar	7.00	1.69	84.00
			CENT-CSS1x2TP Computer Sonics Top Bow Spring	2.92	3.13	20.00
			HWT_SWS-SWS01 Hotwell Swivel Sub	0.90	1.69	2.00
			HWT_DRC-DRC01 Hotwell Double Roller Centralizer (4-arm)	2.77	1.69	10.00
CRCCnt	7.15		HWT_WTS-WTS06 (0006) Hotwell Telemetry Sub	1.82	1.69	8.60
FrmCnt	7.15					
WTSTime	7.15					
WTSTemp	7.15		HWT_MFI-24 (13060148) Hotwell Multi-finger Caliper Tool-24 Finger	4.38	2.00	20.00
CHV	7.15					
Meas	4.72					
MFCBEAR	2.77		HWT_DRC-DRC01 Hotwell Double Roller Centralizer (4-arm)	2.77	1.69	10.00
MFCACCY	2.77					
MFCACCX	2.77					
Aux1	2.77					

Dataset: socalgas ss25_1-21-2016_24mac.db: field/well/run1/Main
Total length: 36.48 ft
Total weight: 299.60 lb
O.D.: 3.13 in

Western Wireline

Company	Southern California Gas Company
Well	Standard Sesnon 25
Field	Aliso Canyon
County	Los Angeles
State	California
Country	U.S.A.

I.19-06-016 DATA REQUEST / PRELIMINARY INVESTIGATION RELATED TO SOUTHERN CALIFORNIA GAS COMPANY'S ALISO CANYON FACILITY

Data Request No: SED 59

Date of this Request: March 30, 2020

Date Responses Due: **On or before April 9, 2020**

To: Gregory Healy
Regulatory Case Manager
Southern California Gas Company
PH: (213) 244-3314
Email: ghealy@semprautilities.com

Avisha Patel
Email: APatel@semprautilities.com

From: Darryl Gruen
California Public Utilities Commission Legal Division
Staff Counsel
415-703-1973

Originated by: Darryl Gruen
Email: djg@cpuc.ca.gov
Phone: (415)703-1973

Cc: Margaret Felts
Nicholas Sher
Darryl Gruen

INSTRUCTIONS

You are instructed to answer the following Data Requests in the above-captioned proceeding, with written, verified responses per Public Utilities Code §§ 309.5, 314, 314.5, 581 and 582, and Rules 1.1 and 10.1 of the California Public Utilities Commission's Rules of Practice and Procedure. Restate the text of each request prior to providing the response. For any questions, email the SED contact(s) above with a copy to the SED attorney. These data requests should be considered continuing so that if any information provided changes, or new information becomes available that is responsive to a request, respondent is requested to supplement its response to SED.

If the respondent objects to any of these data requests, please submit specific objections within five business days. If respondent asserts any privilege, please provide within ten business days a privilege log listing all documents the respondent claims are privileged and the following information for each document: the basis for the privilege claimed, a summary of the purpose and subject of the document withheld, the date of the document, the author(s), and all recipients of the document.

In responding to each request please restate the text of the request prior to providing the response, and provide the name of the person(s) answering the request, the title of such person(s), and the name and title of the person they work for. With respect to each document produced, identify the number of the data request and question number that the document is responding to.

These data requests do not-supersede or excuse any pending oral data requests to the respondent unless that is expressly stated in the written data request.

Identify the person providing the answer to each data request and his/her contact information. Responses should be provided both in the original electronic format, if available, and in hard copy. (If available in Word format, send the Word document and do not send the information as a PDF file.) All electronic documents submitted in response to this data request should be in readable, downloadable, printable, and searchable formats, unless use of such formats is infeasible. Each page should be numbered. If any of your answers refer to or reflect calculations, provide a copy of the supporting electronic files that were used to derive such calculations, such as Excel-compatible spreadsheets or computer programs, with data and formulas intact and functioning. Documents produced in response to the data requests should be Bates-numbered, and indexed if voluminous. Responses to data requests that refer to or incorporate documents should identify the particular documents referenced by Bates-numbers or Bates-range.

If a request, definition, or an instruction, is unclear, notify SED as soon as possible. In any event, answer the request to the fullest extent possible, specifying the reason for your inability to answer the remaining portion of the Data Request.

In answering these data requests, the respondent should adhere to the Commission's Rules of Practice and Procedure (Rules), with particular attention to Rule

1.1 of those Rules, which requires the respondent to "never mislead the Commission or its staff by an artifice or false statement of law of fact." The respondent should keep in mind that "Violations of Rule 1.1 can occur by a failure to correctly cite a proposition of law, *a lack of candor,* withholding information, providing incorrect information, or a failure to correct mistaken information."[1] SED expects the respondent to respond to these data requests with the highest level of candor.

<u>Please provide any and all objections by April 1st, and confirm by April 1st that SoCalGas will be able to respond by April 6th and, if not, the reasons why</u>.

<u>DEFINITIONS</u>

Unless the request indicates otherwise, the following definitions are applicable in providing the requested information.

1. The terms "document," "documents,", "documentary material", or "documentation" include, without limitation, the following items, whether in electronic form, printed, recorded, or written or reproduced by hand: reports, studies, statistics, projections, forecasts, decisions, and orders, intra-office and interoffice communications, correspondence, memoranda, financial data, summaries or records of conversations or interviews, statements, returns, diaries, calendars, work papers, graphs, notebooks, notes, charts, computations, plans, drawings, sketches, computer printouts, summaries of records of meetings or conferences, summaries or reports of investigations or negotiations, opinions or reports of consultants, photographs, bulletins, records or representations or publications of any kind (including microfilm, videotape, and records however produced or reproduced), electronic or mechanical or electrical records of any kind (including, without limitation, tapes, tape cassettes, discs, emails, and records) other data compilations (including without limitation, input/output files, source codes, object codes, program documentation, computer programs, computer printouts, cards, tapes, discs and recordings used in automated data processing, together with the programming instructions and other material necessary to translate, understand, or use the same), and other documents or tangible things of whatever description which constitute or contain information within the scope of these data requests.

2. "Relating to" or "related to" means concerning, addressing, referring, discussing, commenting

   upon, analyzing, mentioning or involving in any way.

3. "Identify":

[1] Administrative Law Judge's Ruling Denying Southern California Edison Company's Motion For Summary Adjudication Of Alleged Rule 1.1 Violations Related To Data Request Responses Dated December 10, 2010, I.09-01-018, January 10, 2012, p. 6.

a. When used in reference to a person includes stating his or her full name, his or her most recent known business address and telephone number, and his or her present title or position;

b. When used in reference to documents includes stating the nature of the document (e.g., letter, memorandum), the date (if any), the title of the document, the identity of the author and/or the document, the location of the document, the identity of the person having possession, control or custody of the document, and the general subject matter of the document.

4. "CPUC" as used herein refers to the California Public Utilities Commission.

5. "SED" as used herein refers to the Safety and Enforcement Division.

6. "SCG" or "SoCalGas" as used herein refers to the Southern California Gas Company and/or its affiliates.

Questions

Question Set 1:

Please provide the documentation that supports the statements quoted below in the document entitled, "Chapter VI Prepared Reply Testimony of Amy Kitson on Behalf of Southern California Gas Company". When providing the documentation, please make sure that the documents are provided in one document with a unique series of Bates numbers. Please provide an index that lists which sets of Bates numbers correspond with each statement.

1. Page 3:
    a. In 2007, SoCalGas began a well integrity program to inspect, evaluate, and mitigate downhole integrity issues.
    b. When working on a well (i.e. during a 're-work'), SoCalGas would replace the tubing, sealing element and wellhead valve, and would additionally inspect the casing.
    c. The inspection work included running ultrasonic inspection tools and pressure testing the well's casing for integrity as warranted.
2. Page 4:
    a. This well inspection and re-work initiative was the precursor to the formalized Storage Integrity Management Program ("SIMP").
    b. (Heading III) SoCalGas Initiated A Formalized Long-Term Storage Integrity Management Program in 2014, Prior to the SS-25 Incident.
    c. SIMP was modeled after long-term integrity management programs for SoCalGas's pipeline system.
    d. SoCalGas identified the utility of an equivalent (to PHMSA's TIMP and DIMP) long-term program for well integrity and proposed SIMP without waiting for regulations to be promulgated.
    e. The SIMP proposal in the 2016 GRC was for SoCalGas to perform a robust assessment of 50% of the storage wells from all four active gas storage fields over the three-year rate case period, thereby accelerating the well integrity evaluations conducted as part of the well evaluation and re-work initiative.
    f. The SIMP scope of work for each well included specific categories of activities such as data collection, threat identification and risk analysis, baseline assessment, remediation, preventative and mitigative measures, and recordkeeping.
    g. SoCalGas' proposed schedule contemplated a six-year timeline to perform baseline assessments of each of its gas storage wells.
3. Page 5:
    a. SoCalGas initiated SIMP prior to a decision on the 2016 GRC. (Note: This sentence has a site referencing D.16-06-054, but it is unclear what exact sentences in that decision SoCalGas means to provide authority for this statement. Please specify the precise page and quote the exact passage.)
    b. In 2014, SoCalGas began development of a SIMP written risk management plan.
    c. SoCalGas also began a SIMP well inspection "pilot program" for well integrity and management work to inform the broader development and implementation of SIMP.
    d. The SIMP pilot program allowed SoCalGas to test the usefulness of casing inspection tools as they were being run at the storage field.
    e. Even prior to 2015, SoCalGas was engaged in research and education regarding the development and effectiveness of new inspection tools in the industry.
    f. During the pilot well testing, SoCalGas compared different technologies (e.g, high-resolution vertilog, multi-sensor caliper and high-resolution ultrasonic tools) from multiple manufacturers to finalize casing inspection tools to be used for SIMP.
    g. One of the tools—the most recent version of the high resolution Vertilog—was selected in October 2014 by a storage field engineer and me during a visit to Baker Hughes headquarters in Traverse City, Michigan to evaluate their inspection tools.
    h. In 2015, as part of SIMP, SoCalGas began installing real-time pressure monitors on its gas storage wells to enhance the well monitoring already in place at SoCalGas' storage facilities.

i. Real-time pressure monitors were installed at the La Goleta storage facility during the summer of 2015, prior to the SS-25 incident.
j. SED contends that SoCalGas Company Standard 224.070 (Gas Inventory-Monitoring, Verification and Reporting), did not include, among other things, a real time collection of data and casing inspection logs. [Footnote omitted].[1] SED fails to appreciate that this standard relates to the monitoring, verification and reporting of the *gas inventory* in underground storage reservoirs. (Emphasis in original)
k. Regardless, SoCalGas' standards provided room to utilize various technologies such as real-time pressure monitoring, which it began installing prior to the SS-25 incident, and casing inspection logs, which were utilized as part of the well evaluation and SIMP pilot programs described above.

4. Page 4

    a. SIMP was underway in October 2015 when the SS-25 incident occurred.

Question Set 2:

> Also in 2015, SoCalGas initiated a data digitization component of SIMP and began the process of transitioning its well-related records from hard-copy to digital files. Data digitization involves electronically capturing information contained in hard copy well files and well records to capture historical drilling, abandonment, and workover information into the WellView database [footnote omitted] with the objective of developing an electronic wellbore schematic.

With this passage in mind, please answer the following:

a. Specify when in 2015 SoCalGas initiated a data digitization component of SIMP.
b. Provide documentation in support of the answer to question 2a.
c. Prior to October 23, 2015, did SoCalGas use the digitized data from its "data digitization component of SIMP" for purposes of SIMP?
d. If so, provide documentation showing this.
e. List the well files by well name that were fully digitized and available for viewing in the WellView database as of October 23, 2015.
f. Prior to October 23, 2015, did SoCalGas use digitized data from the "data digitization component of SIMP" for any of the following things?
    a. Well management and maintenance at Aliso Canyon natural gas storage facility?
    b. Well management and maintenance of SS-25?
    c. Provide all documentation supporting these answers.

Question Set 3

With regards to the statement on page 4 in the conclusion section of Ms. Kitson's reply testimony that says, "SIMP was underway in October 2015 when the SS-25 incident occurred.", please answer the following.

1. Was SoCalGas actually implementing SIMP at the time the SS-25 incident occurred?
2. If so, was SoCalGas implementing SIMP systemwide at the time the SS-25 incident occurred?
3. Given SoCalGas's statement that "The Pipeline Hazardous Materials and Safety Administration (PHMSA) began requiring gas transmission operators to develop a Transmission Integrity Management Program (TIMP) and Distribution Integrity Management Program (DIMP) in 2004 and 2006, respectively" and assertion that "SoCalGas identified the utility of an equivalent [to TIMP and DIMP] long-term program for well integrity and proposed SIMP without waiting for regulations to be promulgated, please answer the following."
    a. At the time the SS-25 incident occurred, had SoCalGas created an equivalent long-term program for well integrity to PHMSA's TIMP or DIMP (or both) requirements?

[1] This sentence is just for context. SED notes a footnote that provides the reference in this case, and is not requesting a reference for this particular sentence.

b. If the answer to question 3.3.b is anything other than an unqualified "no", provide all documentation that shows exactly what SoCalGas did to create the equivalent long-term program for well integrity to PHMSA's TIMP or DIMP (or both requirements).
c. If SoCalGas had created an equivalent long-term program for well integrity to PHMSA's TIMP or DIMP (or both) requirements at the time the SS-25 incident occurred, had SoCalGas begun following that equivalent long-term program for well integrity at that time?
d. If the answer to question 3.3.c is yes, provide documentation showing this.

Question Set 4

1. Identify all wells on which SoCalGas and its contractors ran high-resolution vertilog, multi-sensor caliper and high-resolution ultrasonic tools from 2007 to October 23, 2015.
2. For all wells identified in response to 4.1, provide all reports and interoffice memos generated by contractors and SoCalGas regarding the results of high-resolution vertilog, multi-sensor caliper and high-resolution ultrasonic tools, the assessment of the technology's performance, and any recommendations regarding the future use of the technology in the SIMP program.
3. Provide SoCalGas' schedule (specifically identifying wells) as of October 23, 2015 for SIMP implementation on Aliso Canyon Wells.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Well: Fernando Fee 32 E
A.P.I. No. 037-21321

Field: Aliso Canyon
County: Los Angeles
Surface Location: Sec 27 3N 16W S.B.B.M.

Richard Jackson
Title: ENGINEER
(President, Secretary, or Agent)

Date: 6/25/2007

Signature: Richard Jackson
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300
Telephone Number: 818-701-3251

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
5/18/2007	Move in rig up
5/21/2007	Rigged up PPS slick line, ran in well, pulled equalizing prong. Ran GS pulling tool,unable to pass thru sliding sleeve. Made up 2.70" broach, ran thru SS. Ran GS pulling tool, pulled plug body. Made up "B" shifting tool open sliding sleeve. Rigged up to kill well. Open well with 2193 psi. tubing and casing. Pumped 50 bbls. hi-vis HEC polymer pill displaced with 110 bbls. KCL water. Killed well per schedule with 284 bbls. of 3% KCL water with return to surface.
5/22/2007	Installed back pressure plug. Nippled down production tree. Nippled up class III BOP. Tested blind rams to 5000 psi. for twenty minutes. Removed BPV installed pup jt. Tested pipe rams to 5000 psi. for twenty minutes. Tested Hydril to 3500 psi. for twenty minutes. Tested all control valves and choke manifold to 5000 psi. for twenty minutes. F. Pineda DOGGR waived witness of installation and test of BOPE.
5/23/2007	Backed out hold down studs changed pipe rams to 4-1/2". Unlanded tubing at 55,000 lbs., attempted to release from packer at 7240'. Worked for 4 hours released from packer. Pulled out of well laying down 4-1/2" LT&C casing.
5/24/2007	Pulled out of well laid down GLM, sliding sleeve, no/go and seal assembly. Loaded out casing tongs, changed pipe rams to 2-7/8". Measured and picked up 2-7/8" PH-6 tubing to 3000'. Pulled out of well, made up redresed seal assembly and J latch, 8" L-80 pup joint, on/off tool with PXN plug in place. Ran in well meaured and picked up tubing. Stabbed into packer pulled 15,000 over to check latch. Released from on/off tool filled and tested to 400 psi. for 10 minutes. Pulled out of well. Made up spear, measured and picked up (4) 4-3/4" drill collars. .
5/25/2007	Made up spear, bumper sub, Jars (4) 4-3/4" drill collars and instensifer. Ran in well to top of patch, engaged top cone. Jarred loose at 25,000 over string weight. Pulled out of well laid down spear. Made up spear extension, bumper sub , jars (4) 4-3/4" drill collars and intensifer. Ran in well engaged patch. Jarred loose at 25,000 over string weight. Pulled out of well laid down patch. 1' of patch and bottom cone in well. Ran in well with kill string .
5/29/2007	Pulled out of well with kill string. Made up spear, bumper sub, jars, (4) 4-3/4" drill collars and intensifer. Ran in well to 3000' engaged fish, jarred loose at 60,000. Moved up hole 12' could not jar up or down. Released spear pulled out of well.
5/30/2007	Made up spear 5' stroke bumper sub, jars, (6) 4-3/4" drilll collars, intensifer. Ran in well to 3000' engaged fish. Attempted to drive down well. Jarred up at 60,000 string weight jarred free. Pulled out of well, dragging and hanging up. Laid down fish, recovered both pieces of patch. Made up 6-5/8" and 8-5/8" casing scraper ran in well to 3500'.
5/31/2007	Ran in well to liner top at 7145', 6-5/8" casing scraper 6' inside liner. Pulled out of well, made up 5-1/2" washover shoe, 6-5/8" casing scraper, bumper sub, (6) 4-3/4" drill collars ran in well to 7230' (top of o/o tool). Ran in to packer at 7240'. No fill. Reversed circulated. Pulled out of well to 1200'.
6/1/2007	Pulled out of well laid down shoe and casing scraper. Rigged down tubing equipment and working floor. Nippled down class III BOP. Nippled down tubing head, nipple up double gate.
6/2/2007	Rigged Schlumberger wireline, made up USIT tools. Ran in well logged 6-5/8" from 7230' to 7145' Logged 8-5/8" from 7145' to surface. Rigged down wireline.
6/3/2007	Nippled down double gate. Installed new primary seal, nippled up tubing head. Tested all seals to 5000 psi. for twenty minutes. Nippled up class III BOP. Rigged up tubing equipment. Ran in well with drill collars. Laid down (6) 4-3/4" drill collars.
6/4/2007	Made up WEA 8-5/8" test packer ran in well to 7136'. Packer would not set. Pulled to 7088" Set packer tested lap and WSO hole to 500 psi. for twenty minutes. Pulled out of well laying down 2-7/8" tubing to 5006'. Set packer, tested from 5006' to surface to 950 psi., bled down from 950 to 790 psi. in twenty minutes. Pulled out of well laying down tubing to 3020'. Set packer, tested to 1810 psi. bled down from 1810 to 1200 psi. in twenty minutes. Pulled to 2950', set packer tested to 1850 psi. for twenty minutes, tested good. Ran in well to 3020'. Set packer and retested with same results. Released packer.
6/5/2007	Pulled out of well laying down 2-7/8" PH-6 tubing laid down test packer. Change pipe rams to 4-1/2" . Moved in 4-1/2" tubing trailer rigged up casing tongs. Made up top half on/off tool 6', 2-7/8 pup jt., 2-7" x 3-1/2" crossover, 3 joints 3-1/2" tubing, HES "XD" sliding sleeve, 1 joint of 3-1/2" tubing, gas lift mandrel, 1 joint of 3-1/2" tubing, 3-1/2" x 4-1/2" crossover. Measured and picked up 4-1/2" tubing to 4000'.

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

HISTORY OF OIL OR GAS WELL

Operator: Southern California Gas Company
Field: Aliso Canyon
County: Los Angeles
Well: Fernando Fee 32 E
Surface Location: Sec 27 3N 16W S.B.B.M.
A.P.I. No. 037-21321
Richard Jackson
Title:
(President, Secretary, or Agent)

Date: 6/25/2007
Signature:
(Person Submitting Report)

Address: PO Box 2300, SC9365, Chatsworth, CA, 91313-2300
Telephone Number: 818-701-3251

History must be complete in all detail. Use this form to report all operations during drilling and testing of the well or during redrilling or altering the casing, plugging, or abandonment, with the dates thereof. Include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, and initial production data.

Start Date	Ops. DOGGR Rpt
6/6/2007	Measured and picked up 4-1/2" tubing to 7230'. Bottom half of on/off tool. Latched on/off tool pulled 20,000 over to check latch. Released from on/off tool, changed over to double inhibited packer fluid. Respaced well with 3-1/2" pup joints. Landed with 10,000 compression, pulled 20,000 to check latch, tested annulus to 500 psi. for twenty minutes. Installed BPV and nippled down class III BOP. Nippled up production tree.
6/7/2007	Loaded out equipment. Casing head installed in wrong position casing laterals would not fit. Change postion of tubing head. Rigged down hoist. Rigged down
6/8/2007	Loaded out equipment. Installed laterals and cleaned location.

GGG

AC WELL FILE

Schlumberger

Company: **Southern California Gas Company**

Well: **FF 32E**
Field: **Aliso Canyon**
County: **Los Angles** State: **California**

ULTRASONIC IMAGER
GAMMA RAY- NEUTRON

County: Los Angles
Field: Aliso Canyon
Location: From Station 84
Well: FF 32E
Company: Southern California Gas Compa

LOCATION

From Station 84
1540 Ft. South and 1840 Ft. East

Elev.: K.B. 2010 ft
G.L. 1995 ft
D.F.

Permanent Datum: Ground Level — Elev.: 1995 ft
Log Measured From: Kelly Bushing — 15.0 ft above Perm. Datum
Drilling Measured From: Kelly Bushing

API Serial No.	Section	Township	Range
	27	3N	16W

Logging Date	2-Jun-2007		
Run Number	One1		
Depth Driller	7130 ft		
Schlumberger Depth	7220 ft		
Bottom Log Interval	7225 ft		
Top Log Interval	35 ft		
Casing Fluid Type	Water		
Salinity			
Density			
Fluid Level			
BIT/CASING/TUBING STRING			
Bit Size	11.000 in		
From	717 ft		
To	7190 ft		
Casing/Tubing Size	8.625 in		
Weight	36 lbm/ft		
Grade			
From	15 ft		
To	7189 ft		
Maximum Recorded Temperatures	171 degF		
Logger On Bottom — Time	2-Jun-2007	9:35	
Unit Number — Location	3181	Long Beach	
Recorded By	Mark MacGlashan		
By	Mike Volkmar		

From: Razavi, Avideh
Sent: Friday, December 19, 2014 5:17 PM
To: Schroeder, Tom
Subject: SIMP Draft Response

Hi Tom,

I used some of TIMP/DIMP language to formulate a very general response. I'll be diving into writing the plan with Amy's help using the DIMP and TIMP format. We can discuss and elaborate on each bullet point / chapter of SIMP in our monthly meetings that way everyone can chime in. please let me know if you have any comments or suggestions.

- Alignment with Industry Practices and Benchmarking:
  - The Storage Integrity Management Program is intended for existing gas storage wells only. The integrity assessment is designed to fit location and is well specific due to the diverse geological formation.(we can include a few examples to show the difference between each well and each field and a comparison to other wells in other states if necessary).
  - Schlumberger is working with other Natural Gas Storage Fields within the US to implement a similar program (Well Integrity Management). SoCal Gas will meet with Schlumberger in early 2015 to utilize their expertise.

- Threat Identification & Risk Assessment:

  - Storage is in the process of identifying the main threat categories and developing a risk assessment matrix and methodology similar to TIMP. This methodology provides a framework for the consistent application of threat specific identification criteria. These criteria integrate both casing data and engineering judgment to systematically determine whether or not a threat exists for a given well casing.

  - The effectiveness of the matrix will be tested on wells that have been already assessed (i.e. Frew 2). Once the matrix is complete a baseline assessment plan and consequently the integrity assessment will be established.

  - As the integrity management program matures, much of the detailed data will be gathered on a routine basis and stored in a database to facilitate integrated analysis. A priority will be placed on all data which is required to perform the threat identification and risk assessment. Additional data gathering occurs throughout the year during the pre-assessment and assessment phase for each integrity assessment.

- Preventative & Mitigation measures (P&M):
  - The P&M options include those measures already implemented and any additional measures that may be required to improve the effectiveness of the current maintenance program and/or reduce the probability and consequence of failure. (i.e. SSSV for wells susceptible to land slide, derate pressure).
- Remediation:

SED SUR_REPLY_001225

    - Anomalous conditions discovered through integrity assessment that could reduce the integrity of the casing will be remediated or mitigated. (i.e. squeeze cement and derate pressure)
- Record Keeping:
    - The storage and ready access to important records is an essential part of the Storage Integrity Management Program. Depending on the type of data, there are systems currently in place that are used to store and retrieve information such as well historical data, maps, and operating history. Appropriate personnel have access to the information as needed. Efforts are underway to improve these systems and provide a more useful tool for the Integrity Management purposes.

Avi Razavi
Southern California Gas Company
Storage Engineering – Field Engineer
Aliso Canyon Station
Office: (818) 701-3389
Cell: [redacted]

SED SUR_REPLY_001226

STATE OF CALIFORNIA-RESOURCES AGENCY
GEORGE DEUKMEJIAN, Governor
DEPARTMENT OF CONSERVATION
DIVISION OF OIL AND GAS
6401 TELEPHONE ROAD, SUITE 240
VENTURA, CALIFORNIA 93003-4458
(805) 654-4761

April 18, 1989
Revised July 26, 1989

R.W. Weibel, Agent
Southern California Gas. Co.
810 S. Flower St.
Los Angeles, CA. 90017

GAS STORAGE PROJECT
Aliso Canyo
Sesnon-Frew Zone

The Division of Oil and Gas has responsibility for wells that inject and withdraw natural gas from an underground storage facility. Our records indicate that, although individual wells have been permitted, project approval has not been issued by the Division to conduct underground gas storage operations in the Aliso Canyon field. Therefore, continued operation of the project is approved provided that:

1. Form OG105 or Form OG107 is used whenever a new well is to be drilled for use as an injection-withdrawal well, observation-collection well or whenever an existing well is to be converted to an injection-withdrawal well or observation-collection, even if no work is required. (Specific requirements will be outlined in our answer to your notice.)

2. When an existing well is to be converted to injection-withdrawal or observation-collection, a test is conducted to demonstrate the mechanical integrity of the casings.

3. A monthly injection-withdrawal report is furnished to this division listing the amount of gas injected, injection pressure, and amount of gas withdrawn from each well.

4. Surface pressures on each active or idle well are measured weekly with a calibrated test gauge, and recorded. Evidence of such measurement and calibration must be made available to this Division upon request.

5. All injection piping, valves and facilities meet or exceed design standards for the maximum anticipated injection pressure and are maintained in a safe and leak free condition.

6. The gas storage reservoir pressure shall not exceed 3600 psi. Tests may be required to establish that no damage will occur from excessive injection pressures.

Southern California Gas. Co.
Aliso Canyon

7. A mechanical integrity test is made and filed with this Division for each injection-withdrawal well within three months after injection and/or withdrawal has commenced, at least once every year thereafter, after any significant anomalous rate or pressure change, or as requested by this office to confirm that the stored gas is confined to the intended zones.

8. A Division approved monitoring program plan is installed for the gas storage zone. Data shall be available for periodic inspection or as requested by the Division.

9. The following data are maintained for surveillance and evaluation of the project and are made available for periodic inspection by personnel from this Division:

   a. A graph of oil, water, and gas production rates vs. time for each zone.

   b. A graph of reservoir pressures, gas inventory fluctuations, and injection pressures.

   c. Observation well data, reservoir fluid distribution, temperature, radioactive tracer, and noise surveys.

10. Upon request, the Division is provided with any other data deemed necessary to monitor the operations of the project.

11. The Division is notified of any anticipated changes in a project resulting in alteration of conditions that were originally approved, such as: increase in size of the project, increase in the approved zone pressure; changes in the injection-withdrawal intervals; changes in the observation-collection intervals; or monitoring procedures. Such changes shall not be carried out without Division approval.

12. Any remedial work in the project area necessary because of the gas storage operation on idle, abandoned, or active wells needed to protect life, health, property and oil, gas, or freshwater zones will be the responsibility of the project operator.

13. Injection-withdrawal operations shall cease if any evidence of damage is observed or upon written notice from this Division.

Sincerely,

Patrick J. Kinnear
Deputy Supervisor

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-89 DATED MAY 11, 2020)

SOCALGAS RESPONSE DATED MAY 26, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated May 11, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1a:

Please provide all documents from Western Wireline to SoCalGas requesting consent to use CoreLabs.

RESPONSE 1a:

SoCalGas objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that it seeks the production of information that is

neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence. SoCalGas further objects on the grounds that the request seeks information outside the scope of this proceeding as set forth in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019.

QUESTION 1b:

Please provide all documents that SoCalGas issued authorizing the subcontract to CoreLabs.

RESPONSE 1b:

SoCalGas objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence. SoCalGas further objects on the grounds that the request seeks information outside the scope of this proceeding as set forth in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019.

QUESTION 1c:

Please provide and all emails internal to SoCalGas and with Western Wireline regarding the subject.

RESPONSE 1c:

SoCalGas objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence. SoCalGas further objects on the grounds that the request seeks information outside the scope of this proceeding as set forth in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas further objects to this request to the extent it is burdensome.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-89 DATED MAY 11, 2020)

SOCALGAS RESPONSE DATED MAY 26, 2020

QUESTION 1d:

Please identify bates numbers for the Western Wireline invoice that shows the amount paid for CoreLabs work.

RESPONSE 1d:

SoCalGas objects to this request as vague and ambiguous, and to the extent it assumes SED previously requested and SoCalGas produced, a Bates numbered Western Wireline invoice showing the amount paid for the CoreLabs work. SoCalGas further objects to this request under Rule 10.1 of the Commission's Rules of Practice and Procedure on the grounds that it seeks the production of information that is neither relevant to the subject matter involved in the pending proceeding nor is likely reasonably calculated to lead to the discovery of admissible evidence. SoCalGas further objects on the grounds that the request seeks information outside the scope of this proceeding as set forth in the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see electronic document with Bates range I1906016_SCG_SED_DR_89_0000001.

QUESTION 2a:

In part of its response to SED Data Request 81, Question 13, SoCalGas stated: "Please see previously provided documents with Bates range AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808."

a. According to the CoreLabs Document AC_BLD_0076009, CoreLabs work was performed on November 8, 2015. Of the documents in the Bates Range provided in response to Question 13, the sole document with that same date, November 8, 2015, is document AC_CPUC_SED_DR_16_0025645, which is attached for reference. Please explain exactly how this document AC_CPUC_SED_DR_16_0025645, created on Nov 8, 2015, answers SED DR 81 questions 13-16.

RESPONSE 2a:

SoCalGas objects to this request to the extent it seeks information that is equally

available to SED. Furthermore, SoCalGas objects to this request to the extent it is overly broad and unduly burdensome. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas objected to SED Data Request 81, Questions 13-16 as vague and ambiguous. SoCalGas further objected to Question 13 to the extent it assumed SoCalGas' objective was to identify casing and tubing breaches or to the extent it assumed SoCalGas drafted the referenced language. SoCalGas' response noted the purpose of the "Southern California Gas Company Standard Sesnon 25 Completion Profiler" document with Bates range AC_BLD_0076009 to AC_BLD_0076020 was to run diagnostics of SS-25 and collect information to inform well kill operations. AC_CPUC_SED_DR_16_0025645, and other documents within Bates range AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808, reference diagnostic work on SS-25. For example, AC_CPUC_SED_DR_16_0025645 includes the following entry for 11/8/15: "Began making up slickline tools. Tool string: Spinner, ITL CL, Temperature, Pressure, and GR."

QUESTION 2b:

If page AC_BLD_0076009 does not provide the answers SoCalGas intended, please do the following:

1. Cite to the exact pages in the document range cited by SoCalGas that are responsive to DR 81 Qs 9-16.
2. Quote the text on each cited page that answers SED's questions in DR 81, Questions 9-16.
3. Explain why the quoted text on each page answers SED's questions DR 81, Questions 9-16.

RESPONSE 2b:

SoCalGas objects to this request to the extent it assumes SoCalGas indicated AC_BLD_0076009 provided the answers to SED Data Request 81, Questions 13-16. SoCalGas further objects to this request to the extent it seeks information that is already in SED's possession. SoCalGas also objects to this request as unduly burdensome. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 2.a.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-89 DATED MAY 11, 2020)

SOCALGAS RESPONSE DATED MAY 26, 2020

QUESTION 3a:

a. Does SoCalGas believe the cross-over flow ports for SS-25 at 8451 ft explain the CoreLabs finding of a Corelabs finding of a tubing failure at 8435'? If yes, please explain why.

RESPONSE 3a:

SoCalGas objects to this question as vague and ambiguous and unintelligible. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this request to ask whether SoCalGas believes the cross-over flow ports (rather than a tubing failure) are the reason why gas appeared to flow up the tubing and exit through the tubing at ~8435'. Yes.

QUESTION 3b:

Please explain in lay language:

i. What are cross-over flow ports?
ii. Why did Well SS-25 have cross-over flow ports?

RESPONSE 3b:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "lay language." SoCalGas further objects to this request to the extent it is unduly burdensome and seeks information that is equally available to SED.

i. The cross-over flow ports refer to the ported opening in the Camco SSSV system that allows for gas to cross from flowing up the tubing to flowing up the tubing/casing annulus. The Camco SSSV system is depicted on previously provided document with Bates range AC_CPUC_0000067 at approximately 8451'.
ii. SS-25 had cross-over flow ports to allow for gas to cross from flowing up the tubing to flowing up the tubing/casing annulus.

QUESTION 3c:

Please cite to the page in the SS-25 well file that shows when the cross-over flow ports

in SS-25 were created.

RESPONSE 3c:

SoCalGas objects to this request to the extent it seeks information that is already in the possession of SED and is unduly burdensome. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please see previously provided document with Bates range AC_CPUC_0000067.

QUESTION 4a:

SED understands from SoCalGas' response to Data Request 81 that it believes that CoreLabs analysis on page AC_BLD_0076014 is incorrect. Does SED understand this correctly?

RESPONSE 4a:

SoCalGas objects to this request to the extent it is unintelligible. SoCalGas further objects to this request as vague and ambiguous, particularly with respect to the term "analysis." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. AC_BLD_0076014 provides CoreLabs' observations from running the completion profiler tool on SS-25. SoCalGas is not able to verify what CoreLabs observed in November 2015.

QUESTION 4b:

Quote each bullet on page 6 (AC_BLD_0076014) that SoCalGas believes is incorrect.

RESPONSE 4b:

See Response 4.a.

QUESTION 4c:

For each bullet quoted in response to question 4b, please explain exactly why SCG believes the analysis to be incorrect.

RESPONSE 4c:

SoCalGas objects to this request as overly broad and unduly burdensome. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 4.a.

QUESTION 5a:

a. How does SoCalGas explain the damage to the spinner, if it was not "exposed to an extreme flow rate"?

RESPONSE 5a:

SoCalGas objects to this request to the extent it assumes SoCalGas understands the reason the spinner was damaged. SoCalGas further objects to this request as argumentative.

QUESTION 5b:

b. Please provide a sketch that shows the depths in SS-25 of the following items identified in the above quote:
   i. 8435' (please mark this point on the sketch)
   ii. Tubing plug
   iii. Cameo SSSV
   iv. "Setting depth" at 8380, or where it actually is according to SoCalGas' records
   v. SoCalGas' asserted cross-over flow ports for SS-25 at approximately 8451 feet.

RESPONSE 5b:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "sketch." SoCalGas further objects to this request as unduly burdensome. Moreover, SoCalGas objects to this request to the extent this information is equally available to SED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek the wellbore schematic

for SS-25 prior to October 23, 2015. Please see previously provided electronic document with Bates range AC_CPUC_0000067.

QUESTION 5c:

c. Explain in lay language what the last sentence means: "The plug run confirms no gas flow inside the tubing down to the plug setting depth and of course the plug did not shut off the gas flow to surface."

RESPONSE 5c:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "lay language." SoCalGas further objects to this request to the extent this information is equally available to SED. SoCalGas further objects to the extent this request requires SoCalGas to speak to CoreLabs' understanding or observations.

QUESTION 5d:

d. Please confirm that, despite the CoreLabs report statement that there was a "tubing failure location at ~8435'", there was no Well SS-25 tubing failure at approximately 8435 feet at the time the CoreLabs Report was provided to SoCalGas?

RESPONSE 5d:

SoCalGas objects to this request as argumentative. SoCalGas further objects to this request as vague and ambiguous. SoCalGas also objects to this request to the extent it is duplicative. SoCalGas further objects to this request as unintelligible. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this request to seek whether SoCalGas believes the cross-over flow ports are the reason why gas flow appeared to flow up the tubing and exit through the tubing at ~8435'. Yes.

QUESTION 5e:

e. Is it SoCalGas' contention that CoreLabs incorrectly stated in its report, "It is very likely that the logging string reached the gas flow inside the tubing at the tubing failure location at -8435'."?

RESPONSE 5e:

SoCalGas objects to this request as argumentative. SoCalGas further objects to this request to the extent it is duplicative. SoCalGas further objects to this request to the extent it asks SoCalGas to refute speculation. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas is not aware of any tubing failure at SS-25 as of November 8, 2015.

QUESTION 5f:

f. If so, is it SoCalGas' contention that instead of observing tubing failure at -8435', CoreLabs was observing cross-over flow at the ports for SS-25 that were at approximately 8451 feet?

RESPONSE 5f:

N/A. See Response 5.d.

QUESTION 5g:

g. If SoCalGas is not contending that CoreLabs was observing cross-over flow at the ports for SS-25 at approximately 8451 feet instead of gas flow inside the tubing at the tubing failure location at ~8435 feet, then please answer:
   i. Why is SoCalGas objecting to the request to the extent it assumes there was a tubing failure at 8435 feet?
   ii. What is SoCalGas' precise and complete factual basis for the objection that "SoCalGas further objects to this request to the extent it assumes that there was a tubing failure at 8435'."

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-89 DATED MAY 11, 2020)

SOCALGAS RESPONSE DATED MAY 26, 2020

RESPONSE 5g:

SoCalGas objects to this request as unintelligible, and vague and ambiguous, particularly with respect to the phrase "SoCalGas objecting to the request" and term "precise." SoCalGas further objects to this request as argumentative. Moreover, SoCalGas objects to this request to the extent it is duplicative. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See Response 5.d.

QUESTION 5h:

h. If it is SoCalGas' contention that CoreLabs incorrectly stated in its report, "It is very likely that the logging string reached the gas flow inside the tubing at the tubing failure location at -~8435'.":
   i. Did SoCalGas communicate this point to CoreLabs?
   ii. Provide the documentation showing that SoCalGas communicated this point to CoreLabs.
   iii. Did SoCalGas explain to CoreLabs its point that there were cross-over flow ports for SS-25 at approximately 8451 feet that would instead account for what CoreLabs identified as a very likely tubing failure location at ~8435'?
   iv. After hearing SoCalGas explanation, did CoreLabs check to see that cross-over flow ports for SS-25 at approximately 8451 feet were the reason CoreLabs thought it was very likely that there was tubing failure at ~8435'?
   v. Did CoreLabs communicate to SoCalGas correcting their statement in the CoreLabs report that, "It is very likely that the logging string reached the gas flow inside the tubing at the tubing failure location at ~8435'."?
   vi. Provide that document or documents showing that CoreLabs communicated such a correction to SoCalGas. Be sure to quote the precise passage and page number in the document that shows the communication.
   vii. Provide the method CoreLabs used as its basis for providing the correction to its statement that, "It is very likely that the logging string reached the gas flow inside the tubing at the tubing failure location at ~8435'."

viii. Provide the documents from CoreLabs showing the method that CoreLabs used as its basis for providing the correction to its statement that, "It is very likely that the logging string reached the gas flow inside the tubing at the tubing failure location at ~8435'.".

RESPONSE 5h:

SoCalGas objects to this request as overly broad and unduly burdensome, and unintelligible. SoCalGas further objects to this request to the extent it mischaracterizes SoCalGas' position. SoCalGas further objects to this request to the extent it asks SoCalGas to refute speculation. SoCalGas further objects to this request to the extent it assumes documentation exists. SoCalGas also objects to this request as duplicative and argumentative. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Response 5.d.

QUESTION 6a:

Pursuant to the confidentiality requirements provided at the time of this data request, identify the portions of the CoreLabs Report that are confidential, complete with a legally valid basis for asserting those portions are confidential, and provide a compliant declaration signed by an appropriate SoCalGas officer.

RESPONSE 6a:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the phrase "confidentiality requirements provided at the time of this data request." SoCalGas further objects to this request to the extent it assumes the document is confidential. SoCalGas further objects to this request to the extent it calls for a legal conclusion.

QUESTION 6b:

Confirm that nothing in this data request is appropriately marked confidential.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-89 DATED MAY 11, 2020)

SOCALGAS RESPONSE DATED MAY 26, 2020

RESPONSE 6b:

SoCalGas objects to this request as argumentative. SoCalGas further objects to this request to the extent it is vague and ambiguous, unintelligible, and outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019.

Supplement to Comments of James Mansdorfer

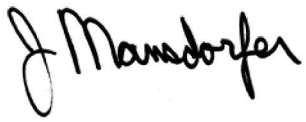
Regarding Aliso Canyon Gas Storage Field

For years I have been trying to bring attention to the risk associated with the Santa Susana fault crossing every well at Aliso Canyon. While I was an employee of SoCalGas those efforts were within the Company, and from January 2016 until April of this year I continued trying to work through the Company. For a year, Dr. Thom Davis has been making presentations at technical conferences to try to bring attention to this risk. It appears that we have finally accomplished bringing attention to this risk, but I believe that some of my comments have been misconstrued and certain comments picked out and used out of context. Therefore I am submitting supplemental comments below. These comments are mine alone and do not reflect input from anyone else. As before, I am not being paid by anyone for any work related to Aliso Canyon.

- As stated in my previous comments, I believe that the work done at Aliso Canyon since the SS-25 incident makes it safe to return to service, but that the risk of the Santa Susana fault needs to be addressed. I participated in the nationwide American Gas Association gas storage committee for many years and so am familiar with storage well configuration and testing/monitoring standards across the industry, and I can say that with the extensive testing of casings and conversion to tubing flow, that Aliso Canyon is probably the safest storage field in the country (excepting the geologic risk). If the geologic risk is properly addressed I believe that the field can be operated without risks to the nearby residents.
- All of the published literature that I have seen on the Santa Susana fault (SSF) indicates it to be an active fault with a high slip rate. There is no question that it crosses every well in the field. There is no history of a fault displacement across a well with high pressure gas, but history of fault displacement across oil wells indicates a probability that well integrity will be lost.
- As stated in my previous comments, it is my belief that if a subsurface safety valve of modern design of the type installed in deep water offshore wells is installed above the storage zone but below the SSF in all wells open to the storage zone, it would prevent loss of gas in the event the SSF moves, thereby eliminating the risk to nearby residents.
- I think it is appropriate that DOGGR gets a report from a team of experts on the geologic risk and the best mitigation method before taking the step of requiring installation of subsurface safety valves rather than relying on the opinion of just a couple of people. There is a possibility that the SSF has become dormant or that subsurface safety valves would not be the proper mitigation.
- The team of experts to provide such a report should be working under direction of DOGGR or some independent organization. Given the ongoing declarations by SoCalGas that Aliso Canyon is safe even before a geologic risk assessment has been completed, I don't think there is any possibility that the public can have confidence in a report from experts working under the direction of SoCalGas' attorneys.

- I believe that allowing injection of gas to a limited pressure while the geologic risk analysis is being performed is appropriate. Injecting gas does NOT increase the probability of movement on the SSF. There are a large number of wells open to the storage zone with gas pressure on them right now, so if the fault were to move today prior to the resumption of gas injection there would still be a large release of gas. Increasing reservoir pressure would increase the rate of gas release if the fault caused loss of well integrity, but the limited pressure being allowed by DOGGR does not substantially increase the risk. The greatest risk is at pressures approaching the previous maximum pressure when the gas pressure at the depth of the SSF crossing the wells is enough to lift the overburden, which could significantly increase the rate of gas reaching the surface.
- Ground shaking from movement of other faults is not a direct threat to loss of well integrity, although it could trigger landslides that could result in gas loss if subsurface safety valves are not installed. Such landslides would only impact a few wells and not have a delivery pathway to the residences, and so the immediate risk to nearby residences is minimal. The point being that the probability of catastrophic release of gas is equal to the probability of movement on the SSF, not the probability of a large earthquake on any nearby fault, which is much higher. I don't know what the probability of the SSF moving in any given year is, but given that the main SSF has not moved during recorded history it is surely quite low.
- There has been considerable discussion about the importance of completing the Root Cause Analysis (RCA) of the SS-25 incident prior to resuming gas injection. In my view, the RCA will be of interest but it is irrelevant to the future safety of Aliso Canyon. We know that the SS-25 incident was caused by loss of casing integrity and that the casing was the sole barrier to contain gas pressure. The RCA will just tell us what caused the loss of casing integrity. However, all wells now open to the storage zone have had extensive testing of casing integrity and gas pressure is now contained to the tubing, so there are two barriers to gas pressure being released. Therefore I see no reason to wait on the RCA to resume gas injection.

In summary, I don't think that it is unreasonable to allow gas injection to a limited pressure while a geologic risk analysis and mitigation resulting from that is completed. The most important recommendation I have to the State is to quickly get an organization in place to manage the geologic risk analysis and to put a short deadline on completion of a report. Personally I question whether the National Labs are the best choice for managing this process because I don't think they are set up to work under short deadlines, although that is just based on my limited exposure to them. There are multiple companies with experience managing such studies that would probably be a better choice.



James Mansdorfer PE

Dale Cole
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Buckhannon, WV 26201
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Fax: 304.472.7758
www.bakerhughes.com

August 1, 2014

Thanks for your interest in attending the HR Vertilog Client Seminar being held October 9, 2014 at the Baker Hughes Headquarters for Corrosion Evaluation Services in Traverse City, Michigan.

The one-day seminar is recommended for clients who would like a more thorough understanding of the HR Vertilog (high-resolution Magnetic Flux Leakage) instrumentation and analysis. The seminar is geared for the experienced client who already has a basic understanding of Magnetic Flux Leakage (MFL) theory and its application to well integrity management.

The basics of MFL measurement theory will be reviewed with emphasis on the high-resolution hardware and analysis. Analysis topics will cover defect assessments utilizing both depth based and pressure based methodologies. The HR Vertilog Final Report will be covered in detail. Pressure based analysis methodologies, selection of pressure based analysis parameters and reporting will be presented. Reporting options which allow the client to improve data handling and well integrity management process will be discussed.

The seminar will cover:

- **MicroVertilog & HR Vertilog**
  - Hardware differences
  - Operational changes
  - Analysis enhancements
  - Basics of high- resolution analysis
- **Defect Assessment Methods**
  - Depth Based Analysis – Length, Width, DOP
  - Pressures Based Analysis (Based on Client Selected Parameters)
- **HR Vertilog Final Report**
- **Roundtable discussion and wrap-up**

For your convenience, I have booked a block of rooms for the nights of October 8th and 9th, checking out on the morning of October 10th, at the Grand Traverse Resort in Traverse City, Michigan. The rate on these rooms is $149.00/night + taxes and fees. If you wish to extend your stay, please contact the resort or let me know and I will arrange. The financial obligation for accommodations is the responsibility of the attendee. If you wish to make other lodging arrangements please let me know so I can cancel your room.

The motel is located just east of Traverse City and is a short drive to the downtown area and the Baker Hughes facility. For transportation from the airport, there is cab service and courtesy shuttle service to the hotel. The airport shuttle is available before 11:00 PM. I have guaranteed the rooms for late arrival. For those of you who have not been to Traverse City, it is a small town located in northern Michigan and is situated on Grand Traverse Bay.

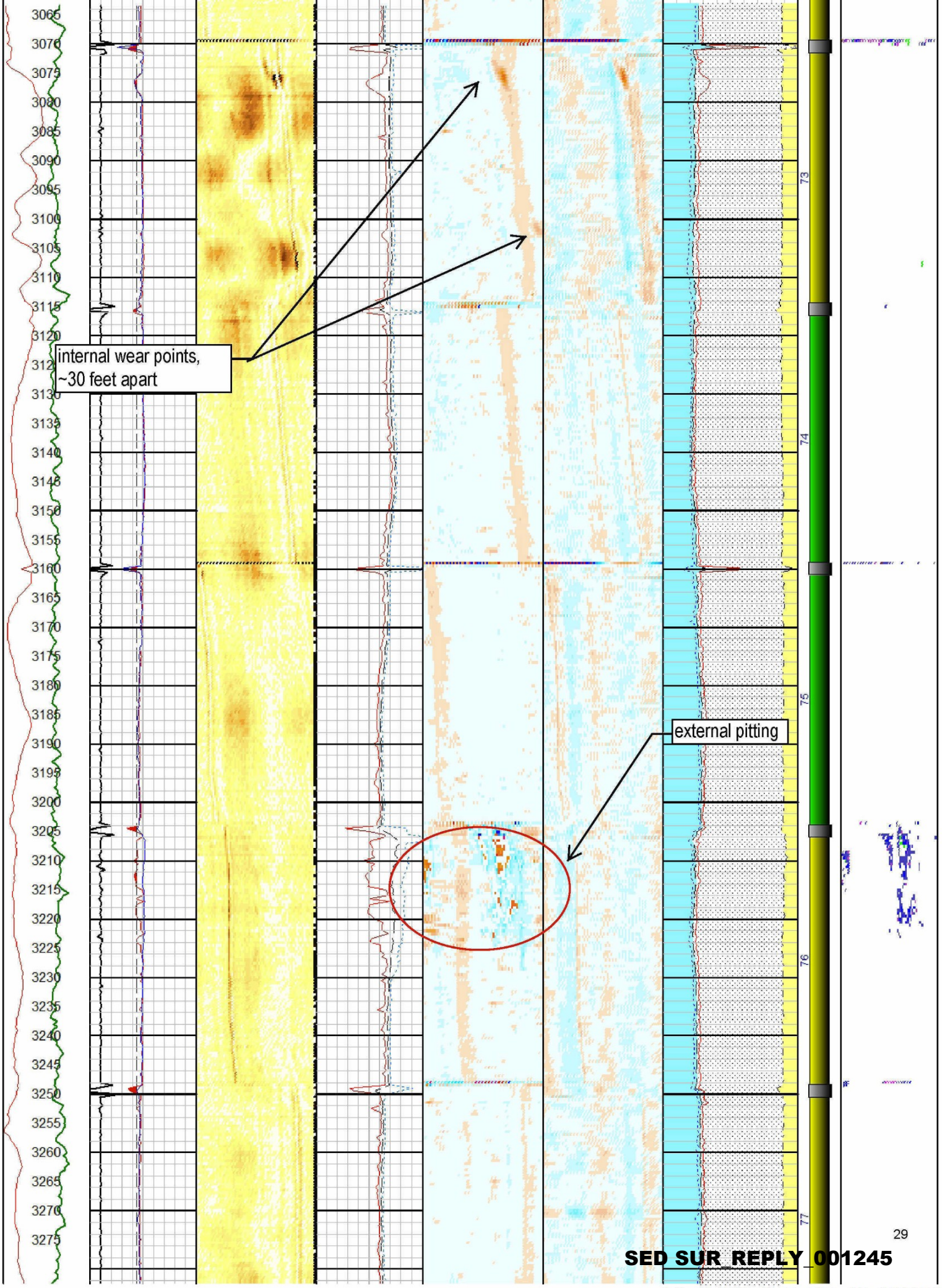
The training seminar will begin at 8:00 am and conclude at 5:00 PM. I have arranged for a shuttle to transport us from the resort to the seminar and back on Thursday, October 9th, as parking is limited at the facility. The school will be held in the conference room at the Baker Hughes Pipe Evaluation Lab. There is no fee to attend the seminar.

Lunch will be provided at the facility and Baker Hughes will host a dinner on the evening of October 9th. The dinner will be at the Aerie Restaurant located on the 16th Floor of the Tower at the Grand Traverse Resort.

Additional information about the Grand Traverse Resort is available at: Grand Traverse Resort, 100 Grand Traverse Village, PO Box 404, Acme, MI 49610, PH: 888-335-7045 www.grandtraverseresort.com

Any questions, comments or concerns please let me know.

Regards,
Dale Cole
304-904-3335
dale.cole@bakerhughes.com


internal wear points,
~30 feet apart
external pitting

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-83 DATED APRIL 18, 2020

SOCALGAS RESPONSE DATED APRIL 27, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 18, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

<u>SED Question Preamble</u>

For this set of questions, please refer to SoCalGas's response to SED Data Request 65, dated April 16, 2020. For reference and convenience of future readers, Data Request 65 was asked with instructions to SoCalGas as follows: "For the following questions, please refer to the document entitled, "Prepared Expert Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on Behalf of Southern California Gas Company".

Page 11 states, "Where circumstances warranted, SoCalGas performed more extensive investigations. Examples of this work done to address leaks at wells FF-34A and Frew 3, where SoCalGas observed migration of gas in the subsurface away from the wellbores. SoCalGas' investigations included gas sampling to confirm the source of the leaking gas and analysis of offset wells to determine the extent of gas migration away from the well with the casing leak. . ."

The footnote of this passage, footnote 41, references Ex. I-14 (SCG00195774). With this passage on mind, please answer the following.

a. Regarding Exhibit I-14, provide evidence that the casing holes identified in the well file at 1000 and 1060 ft in the Frew-3 casing were confirmed and repaired.[1]

b. In support of the answer to question 1a, please provide copies of the well file pages that show the dates, methods of inspection, and type of repair.

In response to this question, SoCalGas responded,

a. SoCalGas objects to this request as vague and ambiguous with regards to the phrase "casing holes identified" and the phrase "holes...were confirmed and repaired." SoCalGas further objects to the degree that it assumes facts regarding the existence of holes at 1000 and 1060 feet in well Frew 3. SoCalGas further objects to this request to the extent that this question is premised on a mischaracterization of Exhibit I-14.

Subject to and without waiving the foregoing objection, SoCalGas responds as follows. A casing hole was ultimately identified at 3240 feet. The leak at 3240 feet was repaired by squeezing cement and installing an inner string.

b. Please refer to the previously produced document with Bates number AC_CPUC_0022894.

With these answers in mind, please refer to Exhibit I-14, and the page with the specific Bates number "AC-CPUC-0022968". That page has at the top a title stating, "Well Activity Reports for Frew 3" (Emphasis in original.), and an entry dated 6/14/84, with the following passage,

"When talking to the Shift Supervisor who worked the Sunday afternoon (6/10) the high annulus pressure was discovered on F-3, he said the well was taking far more gas than normal while on injection. He noted it sounded as if twice the volume of gas was being taken by the well. Flo-log ran a temperature survey and noise log. Temperature ran at 100'/min from 500' to 1500'. A 3 ***cooling anomaly was noted at 1160' and a smaller anomaly was noted at 1100'.*** The noise log showed a large separation between the 200 Hz and the other three frequencies with all frequencies exited. The word used to describe the sound would be "crackling" or "popping". . .

[1] SED notes that the numbers 1000 and 1060 feet were typos in Data Request 65. In fact, these numbers are 1100 and 1060 feet respectively, as shown in this data request.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-83 DATED APRIL 18, 2020

SOCALGAS RESPONSE DATED APRIL 27, 2020

Note: ***The only hypothesis on the condition of the well would be the casing has a hole, split or is ported around 1100'. The subsequent feeding of the leak caused hydrates to form and back up all the way to the SSSV ports.*** This is supported by the "crackling" of the noise log which sounds like a very small amount of gas slowly moving and the inability of the temperature bombs to get below the ports at the SSSV thus showing some "plug" located there. . ." (Emphasis added.)
With these passages in mind, please answer the following:

QUESTION 1:

Admit that on or around June 14, 1984 Aliso Canyon natural gas storage facility SoCalGas discovered that Well Frew-3 experienced a leak at an approximate depth of 1100 feet.

RESPONSE 1:

SoCalGas objects to this request to the degree that it assumes facts regarding a leak at an approximate depth of 1100 feet in well Frew 3. SoCalGas further objects to this request to the extent that this question is premised on a mischaracterization of Exhibit I-14. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to SoCalGas' response to Question 1 of SED Data Request 65 previously provided on April 16, 2020.

QUESTION 2:

If SoCalGas does not make such an admission in response to question 1, then please answer the following:

- **a.** Did SoCalGas do anything to disprove the hypothesis that there was a hole, split or porting on well Frew-3 at approximately 1100', namely, "The only hypothesis on the condition of the well [that] the casing has a hole, split or is ported around 1100'?"
- **b.** If so, state all things that SoCalGas did to disprove its own hypothesis.
- **c.** Provide all documentation showing the things SoCalGas states it did to disprove its own hypothesis in response to question 2b, including reference to page numbers and quotes of passages that show these things.
- **d.** Admit that the larger anomaly located at a depth of approximately 1160 feet was another leak on well Frew 3 discovered on or around June 14, 1984.
- **e.** If SoCalGas does not so admit in response to question 2d, then please answer the following:

i. Did SoCalGas do anything to show that there was no leak on well Frew-3 at a depth of approximately 1160 feet following the entry of these notes on June 14, 1984?

ii. If so, provide all documentation showing what SoCalGas did, including reference to page numbers, and quotes of passages that show all such things.

RESPONSE 2:

a. SoCalGas objects to this request to the degree that it assumes facts regarding a hole, split or porting on well Frew-3 at approximately 1100' in well Frew 3. SoCalGas further objects to this request to the extent that this question is premised on a mischaracterization of Exhibit I-14. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to SoCalGas' response to Question 1 of SED Data Request 65 previously provided on April 16, 2020.

b. Please refer to SoCalGas' response to Question 1 of SED Data Request 65 previously provided on April 16, 2020.

c. SoCalGas objects to this request as unduly burdensome under Rule 10.1 of the Commission's Rules of Practice and Procedure. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please refer to SoCalGas' response to Question 1b of SED Data Request 65 previously provided on April 16, 2020.

d. SoCalGas objects to this request to the degree that it assumes facts regarding a leak at an approximate depth of 1160 feet in well Frew 3. SoCalGas further objects to this request to the extent that this question is premised on a mischaracterization of Exhibit I-14. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to SoCalGas' response to Question 1 of SED Data Request 65 previously provided on April 16, 2020.

e. SoCalGas objects to this request to the degree that it assumes facts regarding a leak at an approximate depth of 1160 feet in well Frew 3. SoCalGas further objects to this request to the extent that this question is premised on a mischaracterization of Exhibit I-14. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to SoCalGas' response to Question 1 of SED Data Request 65 previously provided on April 16, 2020.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

DATA REQUEST SED-SCG-83 DATED APRIL 18, 2020

SOCALGAS RESPONSE DATED APRIL 27, 2020

QUESTON 3:

Assuming that there were leaks on well Frew 3 at approximate depths of 1100 and 1160 discovered by June 14, 1984, then please answer the following:

a. Were these leaks repaired?
b. If so, when?
c. Provide the documentation that shows these answers, including reference to
d. page numbers and quotation of passages.

RESPONSE 3:

a.-d. SoCalGas objects to this request to the degree that it assumes facts regarding leaks at an approximate depth of 1100 and 1160 feet in well Frew 3. SoCalGas further objects to this request to the extent that this question is premised on a mischaracterization of Exhibit I-14. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Please refer to SoCalGas' response to Question 1 of SED Data Request 65 previously provided on April 16, 2020.

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Company Operations Standard
Gas Operations

Routine Well Kills	SCG:	224.045

PURPOSE: **Provide direction in killing a gas storage well in a routine situation.**

1. PLANNING

1.1. Prior to killing the well, review the well file and discuss kill with the **Storage Field Engineer** to ensure that a means of pressure communication exists between the tubing and tubing/casing annulus. Schedule any required wireline work prior to well killing operations.

1.2. Contact and inform the proper **Station personnel** of the scheduled time for the kill. This will allow the **Station personnel** to schedule any necessary piping modifications and to make arrangements for the displaced gas.

1.3. If necessary, make arrangements to have a portable tank moved to the well site, Allow sufficient time to place the tank and install return line prior to the kill.

1.4. Make arrangements with a drilling fluids company and vacuum truck service to have the kill fluid mixed and delivered prior to the kill.

1.5. Make arrangements to have portable radios available for communication when the valve that is used to control gas flow from the well is more than 100 feet from the wellhead.

2. PREPARATION (Guideline)

2.1. Portable Tank Installation

Move a portable liquids storage tank to the well site. If a workover rig will be moved onto the well after it is killed, consult with **drilling representatives** for proper placement of tank.

2.2. Piping Modifications

If piping modifications are required:

2.2.1. Install choke valve and return line at remote casing kill valve and bleed gas pressure off casing according to region job instructions. The casing kill lateral must remain in place until well is killed.

2.2.2. Check the manufacturer's instructions to ensure correct installation of the choke valve. On some wells the choke valve can be installed on the casing withdrawal line, but flow through the casing withdrawal line must not be restricted. There must be a valve in the withdrawal line downstream from the choke that can be closed to isolate the wellhead.

2.2.3. Run a two-inch return line from the choke valve to the portable tank.

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2.2.4. Install gauges to measure the tubing and casing wellhead pressures.

2.2.5. Grease all valves that will be affected by the kill operation. Be sure they operate properly and do not leak.

2.3. Kill Fluid

2.3.1. The kill fluid is mixed and hauled to the well site prior to killing the well. The quantity of kill fluid delivered to the well must be at least 120% of the well volume.

2.3.2. The kill fluid should be filtered whenever possible.

2.3.3. The viscous pill is delivered to the site just before the kill begins. The pill volume must be at least the volume of the well below the circulating depth plus ten barrels, but not more than the volume of the well below the circulating depth plus tubing volume plus ten barrels.

3. WELL KILL USING CONSTANT TUBING PRESSURE METHOD

3.1. Where a pump truck is used, rig up the line from pump discharge to the wellhead with a block valve that is convenient to operate. The line can be rigged up to either the Unibolt or the tubing kill valve.

3.1.1. Calibrate zero point on pressure recorder.

3.1.2. Test pumps and lines to 500 psi above wellhead pressure against the temporary block valve for 15 minutes.

3.1.3. Calibrate pressure recorder with pressure gauge at test pressure.

3.1.4. Bleed off pressure and re-calibrate zero point on pressure recorder.

3.2. Record original shut in casing pressure (OSICP). Connect vacuum truck containing viscous pill to pump intake. With casing shut in, pump viscous pill at two barrels per minute.

3.2.1. After viscous pill is pumped, shut down the pump.

3.2.2. Disconnect pump intake line from vacuum truck and connect to tank containing kill fluid.

3.2.3. If the viscous pill is not of sufficient volume to fill the volume of the well below the circulating depth and the tubing volume, pump enough kill fluid to fill the tubing to the surface.

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3.2.4. Close the master valve. Leave all valves closed for 45 minutes to one hour, or as determined by the **Storage Field Engineer**, to allow the viscous pill to fill pore space adjacent to the wellbore.

3.3. Open master valve and pump kill fluid at a constant rate. Allow casing pressure to increase to 50-75 psi above OSICP. Open the remote casing withdrawal valve just enough to maintain this pressure. If casing pressure does not start to increase after 20 barrels of kill fluid is pumped, stop pumping and shut-in well for 30 - 45 minutes to allow the formation to "heal," then attempt it again.

3.4. During the first portion of the kill with casing pressure 50 - 75 psi above OSICP, tubing pressure should be zero.

3.4.1. As the fluid level in the annulus increases, tubing pressure will increase.

3.4.2. When tubing pressure reaches a pressure P as defined below, disregard casing pressure and manipulate the remote casing withdrawal valve to maintain tubing pressure at P.

3.4.3. P is calculated using Equation 1. P represents the pressure drop in the tubing assuming an average value for density and viscosity of the fluid and friction factor in the tubing.

$$P = \frac{L * Q^2}{2 * D^5} \qquad \text{Equation 1}$$

where:

P = tubing pressure (psig)

L = measured depth of tubing (feet)

D = internal diameter of tubing (inches)

Q = pump rate (barrels per minute)

3.5. Continue pumping at a constant rate while maintaining tubing pressure at P until casing pressure is down to withdrawal line pressure. Record total volume pumped and casing pressure at this time.

3.5.1. Close the operating withdrawal valve and flow gas through the return line to the portable tank, still maintaining tubing pressure at P by manipulating the temporary choke valve. It may be necessary to reduce the pump rate to have a tolerable flow rate at the portable tank.

3.5.2. When fluid returns are obtained, record the total volume pumped and circulate at least 10% of the well volume to ensure no gas cut mud is present.

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3.6. If the fluid returns are gas cut, continue circulating but keep the flow choked back so that tubing pressure does not drop below P. Where returns are going into the same tank that the pump intake is pulling from, monitor the fluid before it reaches the pump intake. Stop pumping when gas cut fluid reaches the pump intake and shut the well in.

3.6.1. When it is not urgent that the well be completely dead, wait until the gas comes out of solution from the fluid in the tank. This may take a day or more depending on the volume and viscosity of the fluid.

3.6.2. If the well must be dead as soon as possible, it will be necessary to bring fresh fluid to continue circulating.

3.6.3. In either case, when pumping commences again, there will be a gas bubble in the annulus. Do not blow this gas down quickly, as this will allow more gas entry from the formation. Choke the flow while pumping to maintain tubing pressure at P.

3.7. It is necessary to estimate the quantity of gas vented to the atmosphere. If casing pressure is between 400 psi and 800 psi when venting to the atmosphere begins, use Equation 2 to estimate the quantity of gas. If casing pressure is outside this range, the Storage Field Engineer should be asked to determine the quantity of gas.

$$V = \frac{Pc(V_2 - V_1)}{2800} \qquad \text{Equation 2}$$

where:

V	=	volume of gas vented to atmosphere (MCF at standard conditions)
Pc	=	casing pressure at the moment when venting to the atmosphere begins (psi)
V_2	=	total volume of fluid pumped at the moment fluid returns are obtained, including volume of pill (barrels)
V_1	=	total volume of fluid pumped at the moment venting to the atmosphere begins, including pill (barrels)

Report the volume of gas vented to the atmosphere to appropriate **Station personnel**.

4. WELL KILL USING SCHEDULE METHOD

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4.1. The schedule method assumes that as the liquid is pumped down the tubing or casing an equivalent head of fluid is being displaced out the other side and a constant bottom hole pressure is maintained.

4.2. The schedule method does not consider any fluid lost to the formation and does not give any direct surface indication of bottom hole pressure. Accurate volume measurement of the fluid being pumped is essential.

4.3. Where a pump truck is used, rig up the line from pump discharge to the wellhead with a block valve conveniently located for ease of operation. The line can be rigged up to either the Unibolt, tubing kill valve, or casing kill valve dependent upon the type of kill (tubing, casing).

4.3.1. Calibrate zero point on pressure recorder.

4.3.2. Test pumps and lines to 500 psi above wellhead pressure against the temporary block valve for 15 minutes.

4.3.3. Calibrate pressure recorder with pressure gauge at test pressure.

4.3.4. Bleed off pressure and re-calibrate zero point on pressure recorder.

4.4. Record original shut-in casing pressure (OSICP). Connect vacuum truck containing viscous pill to pump intake. With casing shut-in, pump viscous pill at two barrels per minute.

4.4.1. If the viscous pill volume is less than the volume to fill the well below the circulating depth and the tubing, pump enough kill fluid to fill the tubing to the surface.

4.4.2. Close the master valve. Leave all valves closed for 45 minutes to one hour, or as determined by the **Storage Field Engineer**, to allow the viscous pill to fill pore space adjacent to the wellbore.

4.5. Kill Schedule Calculation Procedures

4.5.1. Determine total volume to fill tubing and casing above circulating depth.

4.5.2. Determine wellhead pressure assuming tubing and casing both are filled with gas above the pill (assume top of pill is liner top).

4.5.3. Prepare a kill schedule following the example in Table A.

4.5.4. Open master valve and pump kill fluid at a constant rate of approximately 3 bpm. Allow casing/tubing pressure, whichever is used for returns, to increase approximately 50 psi above OSIP; or, after 20 barrels of kill fluid have been

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pumped, open the return line valve just enough to allow a pressure decrease equivalent to the volume of liquids pumped (see kill schedule). If return line pressure does not increase after pumping 20 barrels of kill fluid, stop pumping and close all valves for 30 minutes to allow the formation to "heal," then repeat the procedure. Pressure on the pump side will fall to zero shortly after pumping begins (a volume of 30 - 40 barrels) and remain at zero until returns arrive.

4.6. Continue pumping until return line pressure is down to withdrawal line pressure. Record total volume pumped and return line pressure at this time.

4.6.1. Close the operating withdrawal valve and flow gas through the return line to the portable tank. It may be necessary to reduce the pump rate to have a tolerable flow rate at the portable tank.

4.6.2. When fluid returns are obtained, record the total volume pumped and continue circulating at least 10% of the well volume to ensure no gas cut mud is present.

4.7. If the fluid returns are gas cut, continue circulating until fluid is gas free. Where returns are going into the same tank that the pump intake is pulling from, monitor the fluid before it reaches the pump intake. Stop pumping when gas cut fluid reaches the pump intake and close the well in.

4.7.1. When it is not urgent that the well be completely dead, wait until the gas comes out of solution from the fluid in the tank. This may take a day or more depending on the volume and viscosity of the fluid.

4.7.2. If the well must be dead as soon as possible, it will be necessary to bring fresh fluid to continue circulating.

4.7.3. In either case, when pumping commences again, there will be a gas bubble in the annulus. Do not blow this gas down quickly, as this will allow more gas entry from the formation. Choke the flow while pumping to maintain tubing pressure at P.

4.8. It is necessary to estimate the quantity of gas vented to the atmosphere. If casing pressure is between 400 psi and 800 psi when venting to the atmosphere begins, use Equation 2 to estimate the quantity of gas. If casing pressure is outside this range, the **Storage Field Engineer** should determine the quantity of gas.

$$V = \frac{Pc(V_2 - V_1)}{2800} \qquad \text{Equation 2}$$

where:

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V = volume of gas vented to atmosphere (MCF at standard conditions)

Pc = casing pressure at the moment when venting to the atmosphere begins (psi)

V_2 = total volume of fluid pumped at the moment fluid returns are obtained, including volume of pill (barrels)

V_1 = total volume of fluid pumped at the moment venting to the atmosphere begins, including pill (barrels)

Report the volume of gas vented to the atmosphere to the Station.

TABLE A
Example Well Kill Schedule

SIWHP = 1500 PSIG

Total Well Capacity = 200 Bbls.

$$\frac{(1500+50)\text{psi}}{(200-20)\text{bbl}} = 8.61 \text{ psi/bbl}$$

Therefore, bleed off approximately 8.61 psi of pressure for each barrel of kill fluid pumped. The returns should arrive at surface when wellhead pressure reads zero (psig).

SIWHP (PSIG)	LIQUID PUMPED * (BBLS)
1500	0
1500	20
1378	40
1205	60
1034	80
862	100
690	120
518	140
346	160
174	180
0	200

*Pumping at approximately 3 bbl/min

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5. Circulating Fluid with a Wireline Plug Installed in the Tubing (No-Go) Profile Nipple

5.1. Install gauges on the tubing and casing. Set a wireline plug in the profile nipple below the sliding sleeve. Open the sliding sleeve. Reduce the tubing pressure by 200 psi. If the casing pressure also falls, the sleeve is verified open and communication between tubing and casing has been established.

5.2. Calculate the well volume above the wireline plug and packer and record the equalized wellhead pressure.

5.3. Block both surface safety valves open and remove the high pressure pilot, low pressure pilot and sacrificial probes etc. and lateral piping. Install temporary piping on either the kill or injection lateral and connect it to a tubing and a casing wellhead valve. Install temporary piping on the opposite tubing and casing wellhead valves and route them to the inlet of a portable separator. Connect the "Gas Out" of the separator through an adjustable choke to the withdrawal piping and the "Liquid Out" of the separator to an empty fluid tank.

5.4. The goal of this method is to replace gas pressure with hydrostatic head. It is important to keep differential pressure across the wireline plug constant while circulating gas out of the well. This is done by dividing the wellhead pressure (psi) and calculated fluid volume by 20, then pump fluid and reduce gas pressure in equal increments. Gas is flowed from the casing through the separator to the withdrawal line while fluid is pumped into the tubing until fluid returns on the casing is achieved.

Refer to the example below:

Pressure	Volume
2250	50
2137.5	75
2025	100
1912.5	125
1800	150
1687.5	175
1575	200
1462.5	225
1350	250
1237.5	275
1125	300
1012.5	325
900	350
787.5	375

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675	400
562.5	425
450	450
337.5	475
225	500

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NOTE: Do not alter or add any content from this page down; the following content is automatically generated.
Brief: Section 5 was added describing circulation of fluid above a wireline plug installed in the tubing.

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Company Operations Standard

Well Operations - Well Kill	SCG:	224.0030

PURPOSE **A well kill may be required to perform workover operations, to stop gas loss due to a casing, wellhead, or shoe leak, or to perform wireline or wellhead work that cannot be performed otherwise.**

1. POLICY

1.1. The **Storage Field Engineer** is responsible for well kills. Responsibility may be delegated to certain other **Company** personnel in some circumstances. The person in charge, in accordance with pre-arranged kill plans immediately handles emergency kill jobs. The **Storage Operations Manager** and **Storage Engineering Manager** are informed of such incidents as soon as practical.

2. RESPONSIBILITIES & QUALIFICATIONS

2.1. FACILITIES OPERATIONS

2.1.1. Storage Field personnel operate all surface valves. On routine kills, notify the **Storage Field Engineer** at least two days prior to killing the well to allow time for piping modifications and to make arrangements to accept the displaced gas through the withdrawal system.

3. DEFINITIONS

3.1. Not Applicable

4. PROCEDURE

4.1. OVERVIEW

4.1.1. This document provides guidelines for routine, planned kill jobs. Emergency kills that are performed because of unplanned conditions that may result in uncontrolled discharge of gas require special procedures for each case. Special kill plans for emergency conditions are prepared by **Storage Engineering.**

4.1.2. Killing a well involves circulating a fluid into the well that provides a higher hydrostatic pressure than the reservoir gas pressure, effectively resulting in zero pressure at the surface.

4.2. FLUID

4.2.1. The fluid used to kill a well must be of sufficient density to provide a 200 to 500 psi overbalance over the reservoir pressure and viscous enough to prevent excessive fluid loss to the formation.

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4.2.1.1. The fluid must be designed to minimize formation damage. This requires low solids content to prevent pore plugging.

4.2.1.2. The fluid must have high enough salinity to prevent swelling and dispersion of formation clays.

4.2.1.3. The best fluid to use is formation water produced from the zone to be killed if it has high enough density to provide the 200 to 500 psi overbalance. When a higher density is required, use KCI or CaCl2 water to the needed density. The KCI or CaCl2 will generally prevent clay swelling or dispersion even at low concentrations. See **STANDARD 224.05**, *Blowout Prevention Equipment Configuration, Installation, Testing and Operation*, for the method of calculating the required fluid density.

4.2.1.4. A viscous pill may sometimes be used when killing a well to prevent excessive fluid loss to the formation. However, at Aliso Canyon and Honor Rancho when the reservoir is at high inventory, a viscous pill may not be necessary. Adequate viscosity for a pill can be obtained by mixing two pounds of HEC polymer per barrel of fluid. The remainder of the kill fluid should be viscosified by adding 1.0 pounds of HEC per barrel of fluid. The kill fluid should also contain biocide, corrosion inhibitor, oxygen scavenger and foam retardant in amounts recommended by the Storage Engineering Department.

4.2.1.5. Do not use a HEC viscous pill at the Playa Del Rey field because stubborn emulsion problems will develop. Kill fluid at Playa Del Rey should also contain 3% Misol or A-Sol G15 by volume to minimize emulsion formation. Misol is currently available from MTS Stimulation Services and is the preferred chemical. A-Sol G15 is a Welchem product available from BJ Services.

4.3. EQUIPMENT (Figure 1)

4.3.1. Pump

4.3.1.1. The pump used to kill the well must be capable of pumping against the shut-in wellhead pressure plus 500 psi. It should be capable of at least a three-barrel-per minute rate at the highest wellhead pressure. The pump should be equipped with a calibrated pressure recorder.

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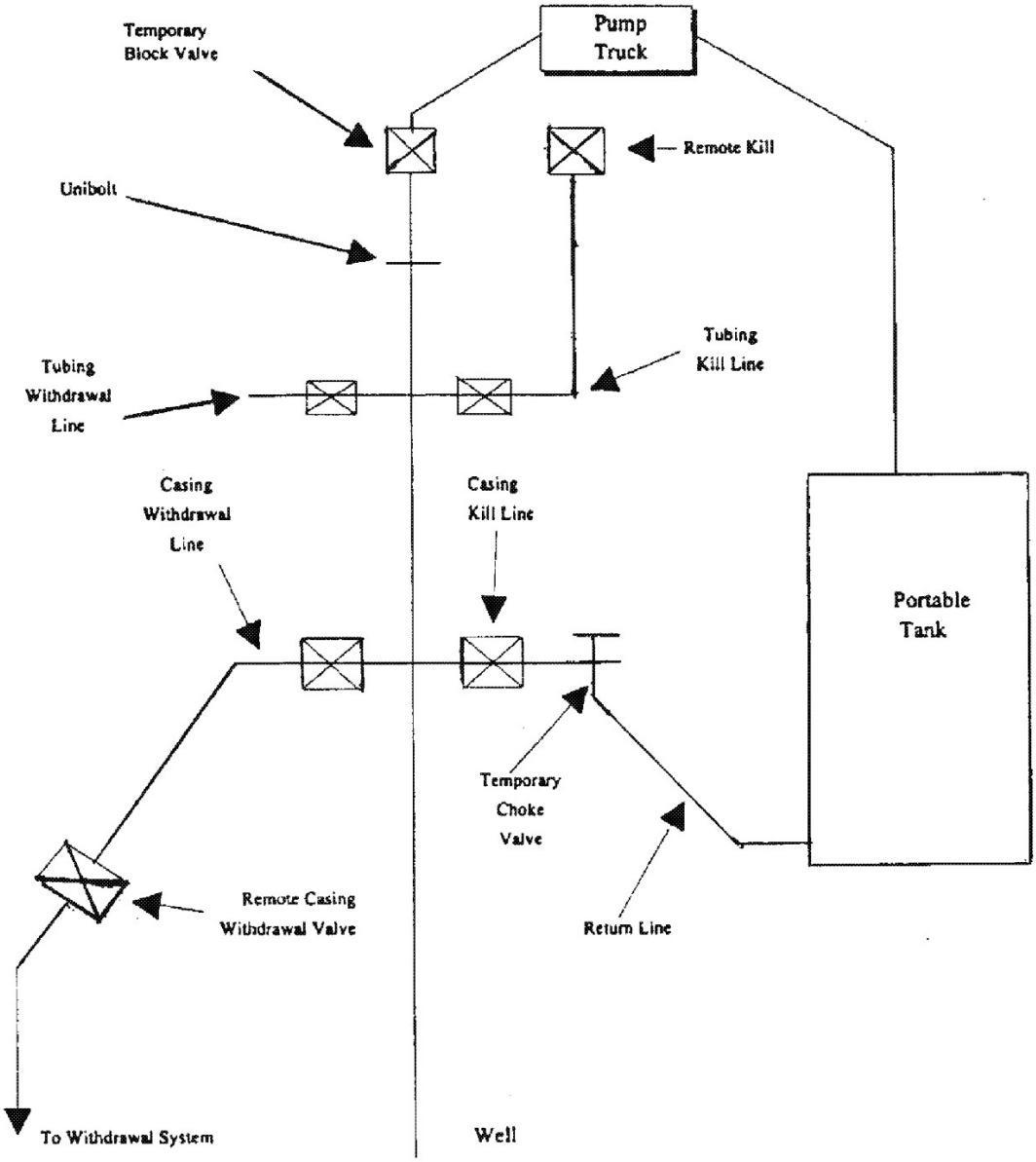

FIGURE 1
TYPICAL PIPING SCHEMATIC

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4.3.2. Lines and Valves

4.3.2.1. When a pump truck is used to kill the well, all lines from the pump truck to the wellhead must be at least 5,000 psi pressure rating. Install a valve of at least 5,000 psi pressure rating between the line from the pump truck and the wellhead or remote kill valve.

4.3.2.2. The well may also be killed through the Company kill line.

4.3.2.3. Install choke valve of at least 5,000 psi pressure rating on the casing kill side or other suitable location that will allow casing pressure to be bled down to atmosphere without having the low pressure sensor prevent flow by closing the surface safety valve.

4.3.2.4. A return line of at least 1,000 psi pressure rating is installed between the choke valve and the tank used to hold fluid returns.

4.3.3. All components between the wellhead and the choke valve must have a pressure rating that is equivalent to or exceeds that of the wellhead.

4.4. PROCEDURES

4.4.1. The preparations and kill operations are carried out in accordance with **STANDARD 224.045**, *Routine Well Kills*.

5. RECORDS

5.1. Record the pressure during a kill operation on a pressure chart.

5.1.1. Measure and record the total volume of fluid used.

5.1.2. The volume of gas vented to atmosphere is estimated and reported to the Storage Field Engineer.

5.2. If the well is killed by a **Rig Supervisor**, attach these records to the Daily Activity Report. If the well is killed by someone other than a **Rig Supervisor**, retain these records in the field well file.

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Company Operations Standard

Well Operations - Well Kill	SCG:	224.0030

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Company Operations Standard

Blowout Prevention Equipment Configuration, Installation, Testing and Operation	SCG:	224.05

PURPOSE **To ensure that effective blowout prevention equipment and practices are used during drilling and workover operations.**

1. POLICY

1.1. This document sets the mandatory Company responsibilities and requirements with respect to the appropriate configuration, installation and testing of blowout prevention equipment (BOPE) used during drilling and workover operations. BOPE requirements are mandated by the California Division of Oil, Gas and Geothermal Resources (D.O.G.G.R.) regulations (Title 14) and referenced in the DOGGR manual ***Blowout Prevention in California***. All Rig Supervisors and Storage Field Engineers are to be familiar with this Company Gas Standard.

1.2. Primary well control is achieved during drilling and workover operations by maintaining a hydrostatic pressure in the wellbore that exceeds reservoir pressure. Adequate hydrostatic pressure is achieved through the proper design of drilling and workover fluid as well as through operational procedures to ensure that a sufficient column of fluid exists in the well at all times. Adequate and fail safe functioning blowout prevention equipment must be maintained in the event of loss of primary well control which has the potential to occur at any time during operations. Rig personnel must be familiar with safe operating practices and fully trained to operate the BOPE if necessary.

1.3. A copy of the D.O.G.G.R. manual ***Blowout Prevention in California*** shall be on location for reference whenever BOPE equipment is in use.

2. RESPONSIBILITIES

2.1. Storage Engineering Manager

2.1.1. The Storage Engineering Manager is responsible for supervising and advising Storage Field Engineers.

2.2. Storage Field Engineers

2.2.1. The Storage Field Engineers are responsible for preparing detailed work programs based on evaluation of known or anticipated conditions. They design and recommend to the Storage Engineering Manager all equipment, materials and procedures used.

2.2.2. Supervising and advising Rig Supervisors.

2.2.3. Keeping the Storage Engineering Manager informed of operations and obtaining approvals of practices that deviate from this procedure.

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2.3. Rig Supervisor

2.3.1. The Rig Supervisor is responsible for planning and supervising the work outlined in the well program.

2.3.2. Ensuring that all work is performed safely in accordance with established Company guidelines and industry standards.

2.3.3. Ensuring that blowout prevention equipment is properly installed, inspected, tested and operated at all times.

2.3.4. Ensuring that rig crews are adequately trained to control the well at all times, including detection and proper response to well kicks and maintenance of proper fluid columns.

2.3.5. Keeping the Storage Field Engineer informed of potential hazards or operational difficulties and assisting as necessary in resolving such situations.

2.3.6. Seeking advice and counsel from the Storage Field Engineers, Storage Engineering Manager, other Rig Supervisors or staff personnel.

3. WELL CLASSIFICATION

3.1. STORAGE ZONE WELLS

3.1.1. BOPE classification of wells planned for drilling or workover operations in the storage zone are based on selection guidelines from the DOGGR manual ***Blowout Prevention in California (Chapter 2).***

3.1.2. The Storage Engineering Manager may specify additional preventers and/or safety measures, but shall always meet minimum D.O.G.G.R. classification requirements.

3.1.3. The required BOPE classification for workover operations in each storage field is summarized in Table 1. Note that the BOPE classification for each field is based on the maximum pressure for the field even though the well work operations may occur at lower pressure in the range. Reservoir pressure range, well depth range, and gradient are included for reference.

Table 1

Classification of Storage Zone Wells, by Field (Workover Operations)

	Reservoir		Maximum	Well Classification

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Storage Fields	Pressure Range (psig)	Well Depth Range, MD (ft.)	Gradient psi/ft	At Maximum Reservoir Pressure
Aliso Canyon	2000 - 3602	7100 - 9400	0.522	III - 5,000
Honor Rancho	1100 - 4411	9000 - 11000	0.465	III - 5,000
La Goleta	1570 - 2050	3900 - 4300	0.529	III - 3,000
Playa Del Rey	850 - 1710	5800 - 7100	0.465	III - 3,000

3.1.4. Additional Class III BOPE Requirements

3.1.4.1. The choke manifold shall have a minimum of two adjustable chokes and three independently valved outlet lines. See Figure 1 for choke manifold configuration. All fittings on this manifold shall meet or exceed D.O.G.G.R. guidelines for choke manifold components and shall be mounted on a single unit.

3.1.4.2. All hydraulic connections from the actuating unit to the preventer are to be large enough to supply hydraulic fluid rapidly without excessive friction loss, and shall be no less then 1" (nominal) diameter.

3.1.4.3. A complete functional test of the BOPE shall be performed after installation, after partial or complete disassembly and prior to continuing operations potentially dependent upon the functionality of the BOPE. Testing shall be in accordance with field testing requirements set forth in Section 3.6 of this document.

3.1.4.4. Closure checks of the annular preventer may be performed at a reduced closure pressure, typically 700 psi, in order to prevent abnormal wear of the packing material. Following completion of the routine checks, the regulator shall be immediately restored to its normal working pressure, typically 1500 psi. This may only be done provided the hydraulic actuating system has tested satisfactorily at or above the normal working pressure.

3.1.4.5. Two auxiliary pump-in components are needed. One 2" line will be tied into the kill side of the well or lower mud cross and extend

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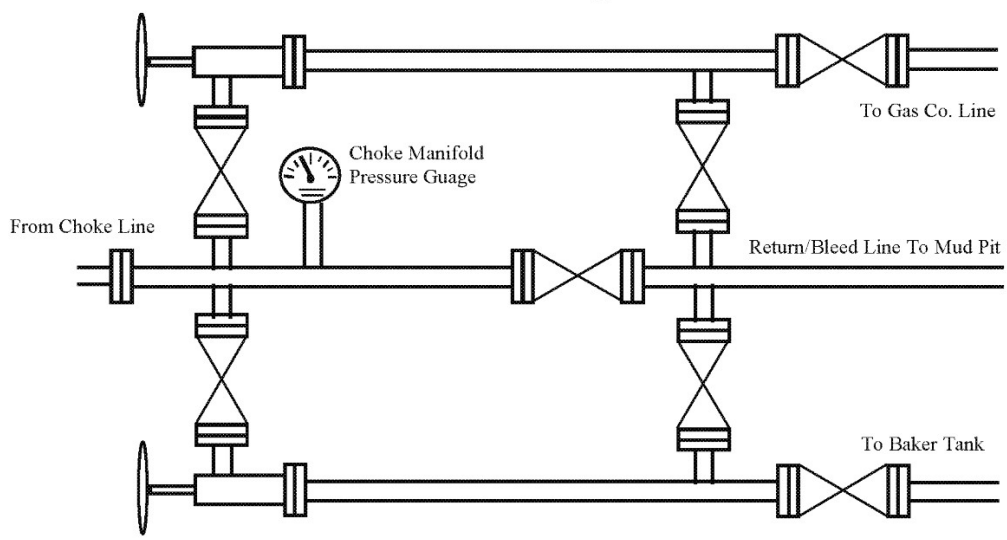
outside the rig substructure where a secondary kill pump such as a cement truck can be connected. This extended kill line will be positioned such that it is not necessary to go under the substructure to operate it. A check valve and a block valve will be installed at the end of this line and all components will be rated to 5000 psi. This line will be staked to the ground to prevent whipping. This block valve will be clearly marked with a sign that states "EMERGENCY KILL". An additional 1" pump in valve will be available on the accumulator where a secondary pressure supply can be connected. This valve will be fitted with a bull plug and clearly marked with a sign that states "AUXILIARY PUMP IN"

3.1.4.6. The DOGGR may require the use of a Class III B BOPE, in the event that drilling operations are planned in the storage zone during workover operations

Figure 1

Choke Manifold Configuration



3.2. NON STORAGE ZONE WELLS

3.2.1. BOPE classification of wells planned for drilling or workover operations in non storage zone wells are based on selection guidelines from the DOGGR manual ***Blowout Prevention in California (Chapter 2).***

3.2.2. Non storage zone wells are defined as existing wells in the storage field that are not drilled through the storage zone. Non storage zone wells have known

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conditions of pressure and not able to sustain production to surface without a form of artificial lift. Wells in the Aliso Canyon shallow zone, Honor Rancho water injection zone, and Montebello oil production zone are defined as non storage zone wells. The required BOPE classification for workover operations in non storage zone wells is Class II 3000 psi.

3.3. ADDITIONAL CLASS II BOPE REQUIREMENTS

3.3.1. For wells or well operations that fall within the D.O.G.G.R. Class II classification requirements, the following additional specific Company provisions shall also apply. Supplementary measures beyond those outlined below may be required or utilized as appropriate.

3.3.2. Additional Class II BOPE Requirements

3.3.2.1. Wells with potential to encounter abnormally high zone pressures.

Where any possibility of encountering an abnormally charged zone or zones exists, BOPE Class II stack arrangement shall minimally consist of an API type "RA" (annular and ram-type preventer combination) arrangement. This includes shallow zone wells where such shallow zone has the potential to have communication with a storage zone through unexpected or unknown leaks.

3.3.2.2. Wells with no potential of encountering abnormally high zone pressures.

Only wells or well operations meeting D.O.G.G.R. Class II BOPE prerequisites that have no potential of encountering abnormally high zone pressures and no potential of encountering zones charged by storage zone leaks shall be eligible for API type "A" arrangement, where the use of a single annular preventer is specified. An example of operations where Class II type "A" arrangements would be permissible is on a shallow zone observation well with known pressures, where casing would not be penetrated into zones of potentially unknown or unexpected pressure.

3.4. FLUIDS

3.4.1. General

Density of the drilling or workover fluid shall be maintained such that a safe over-balance pressure condition exists at all times. A minimum safe over-balance condition is generally defined as 10% greater then the maximum

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possible Bottom Hole Pressure (BHP), but not high enough to cause consistent fluid loss. This minimum over-balance requirement is waived when conditions warrant it, such as during under-balanced drilling or well testing, provided adequate precautions are taken for safe operations under these abnormal conditions and the methodology was set forth in the approved well program.

3.4.2. BHP Determination for Zones of Known Pressure

BHP (or Zone Pressure) for wells in potential communication with a reservoir of known pressure can be determined based on the Shut-in-Well-Head-Pressure (SIWHP) of that well, or a geologically similar well, and then by increasing the SIWHP according to Figure 2 to compensate for the static column of gas in a shut-in well. The BHP is then increased by a minimum 10% safety factor and used for determination of fluid density. Because storage reservoir pressures can change significantly during a drilling or work-over operation, the SIWHP of the well or a geologically similar well shall be checked no less than once per week, and recorded on the daily safety report. The fluid density shall be adjusted as necessary to maintain safe operating conditions.

3.4.3. BHP Determination for Zones of Unknown Pressure

BHP for wells in potential communication with an oil or gas reservoir of unknown pressure shall be determined by multiplying the True Vertical Depth (TVD) by a maximum formation pressure gradient corresponding to the discovery pressure of the field. See reference Table 1 for a Maximum Pressure Gradient for individual fields. A 10% safety factor is then added to determine a minimum safe over-balance pressure and the corresponding fluid density.

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Figure 2
Mud Density Calculation for Gas Wells

Step 1

Find Zone Pressure of a Gas Well:

Zone Pressure = (0.000025 x TVD x SIWHP) + SIWHP

TVD = True vertical depth at top of storage zone

SIWHP = Shut-in wellhead pressure

Step 2

Determine Safety Margin:

Safety Margin = Zone Pressure X 0.10

Under most conditions a safety margin of 10% will be adequate. The safety margin may be set higher at the discretion of the Rig Supervisor and Storage Field Engineer . If the "Calculated Safety Margin" is less than 250 psi and the well has contact with a storage zone, a "Minimum Safety Margin" of 250 psi shall be used. The Safety Margin should not be less than 250 psi unless approved by the Storage Field Manager.

Step 3

Find Working BHP

Working BHP = Zone Pressure + Safety Margin

Working Bottom Hole Pressure is the pressure desired to be exerted by the mud column.

Step 4

Find Desired Minimum Mud Density:

Mud Density (ppg) = 19.25 x Working BHP ÷ TVD

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3.5. BLOWOUT PREVENTION EQUIPMENT

3.5.1. General Requirements

3.5.1.1. The BOPE shall be capable of shutting in and containing the well pressure under all situations to prevent the escape or leakage of fluids from the well.

3.5.1.2. All equipment, including preventers, mud crosses, wellhead equipment, manifolds, lines and valves that may be exposed to wellbore pressure during either normal or well control operations must be of sufficient working pressure rating to contain the maximum anticipated surface pressure.

3.5.1.3. A full opening safety valve is to be located on the rig floor. The valve shall be equipped with a wrench to operate it and all necessary crossovers appropriate to thread into each type of pipe being run, where such pipe can act as a pressure control string or kill string.

3.5.1.4. All chicksan and armored hoses shall be of a minimum 5,000 psi rated working pressure.

3.5.1.5. All BOPE equipment shall meet or exceed D.O.G.G.R. requirements for the classification usage required by the well conditions and as called out in the well program.

3.5.2. Blowout Preventer Installation

3.5.2.1. All BOPE equipment shall be in good working condition meeting or exceeding D.O.G.G.R. requirements and manufacturer's maintenance requirements. BOPE equipment includes, but is not limited to: accumulators, rams, controls, valves, fittings, gauges, manifolds and all hoses and bolts associated with the complete BOPE system.

3.5.2.2. Flanges and all other sealing surfaces are to meet or exceed API 6A requirements. Ring gaskets shall be kept in their boxes until ready for use and shall be stored in a manner to prevent mechanical and/or chemical deterioration.

3.5.2.3. Blowout Preventer Support

Adequately cemented surface casing of strength adequate to support the blowout preventers shall be used for BOPE support as required by D.O.G.G.R. field rules.

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3.5.2.4. Size and Materials

The bore of all preventers, spools and mud crosses is to be of sufficient size to accommodate the largest equipment to be run into the casing below the preventers and must meet or exceed specifications as set forth in American Petroleum Institute (API) Specification No. 6A.

3.5.2.5. Drill Collar Lifting Subs

All drill collar lifting subs used on pipe lowered below the blind rams shall be threaded on top with a standard thread configuration such that the pipe using the lifting sub may be fished or circulated through. This requirement eliminates the use of bails or lifting eyes on lifting subs used in this manner.

3.5.3. Pre Rig-Up Testing and Certification

3.5.3.1. Dimensional and Mechanical Integrity

At the discretion of the Storage Field Engineer, certification of dimensional, hydrostatic or mechanical integrity tests may be required prior to operations. Where pre rig-up hydrostatic pressure testing is performed in lieu of on-site tests, the hydrostatic pressure testing will be accordance with Section 4.6 - TESTING REQUIRMENTS. These tests may also have witness requirements whereby a **Gas Company** employee or representative witnesses the testing and certification process. Testing may also require a complete tear down of the equipment for dimensional and mag-particle inspection of components. All testing or inspection criteria and methodology shall be accordance with D.O.G.G.R., API and equipment manufacturer's recommendations. Where requirements vary, the stricter guideline or requirement shall be adhered to.

3.6. TESTING REQUIREMENTS

3.6.1. General Testing Requirements

3.6.1.1. The goal of field testing is to establish and document that the BOPE can withstand the fluid and gas pressures that may occur during containment of a blowout, and to ensure that equipment utilized by the Gas Company fully complies with California Division of Oil and Gas requirements. All testing procedures are to meet or exceed the requirements of the D.O.G.G.R. as specified in Section 5 of the D.O.G.G.R. publication *Blowout Prevention in California*.

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3.6.1.2. Notification of the D.O.G.G.R. shall be done in accordance with permit requirements and in ample time to have an inspector on location as necessary. When a D.O.G.G.R. representative witnesses a test, the representative will sign the tour sheet in accordance with D.O.G.G.R. requirements and note the witnessed operation in the daily report. If a D.O.G.G.R. representative waives a witnessing requirement, the date and time of the waiver, the nature of the waived witnessing requirement and the names of the Gas Company and D.O.G.G.R. representatives responsible for the waiver shall be noted on the tour sheet and in the daily report.

3.6.2. Hydrostatic Pressure Testing

3.6.2.1. All testing or inspection criteria and methodology shall be in accordance with D.O.G.G.R. API and equipment manufacturer's recommendations. Where requirements vary, the stricter guideline or requirement shall apply. BOPE tests performed on a storage zone well or on a shallow-zone well where abnormal pressures may be encountered (such as work performed on a possibly gas-charged shallow zone) shall include a chart of BOPE pressure test(s).

3.6.2.2. Hydrostatic pressure test charts shall bear the time and date of the test, safe working pressure, the actual test pressure, serial number or other identifying number of the item tested and the printed name and signature of the personnel completing the test. When a pressure test is done on a specific wellhead or BOPE stack for a specific well, the name of the well shall also appear on the chart.

3.6.2.3. Where pre rig-up hydrostatic pressure testing is performed in lieu of on-site tests, the hydrostatic pressure testing will be charted and the charts furnished to the Supervising Engineer and/or the Rig Consultant prior to the start of operations that are dependent upon the functionality of the tested equipment.

3.6.2.4. Hydrostatic pressure test of components to be used in the well shall be in accordance with API hydrostatic testing guidelines as follows:

- A primary pressure-holding period
- Reduction of the pressure to zero
- A secondary pressure-holding period

The timing of the secondary holding period shall not start until the test pressure has stabilized and the equipment and the

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pressure monitoring devices have been isolated from the pressure source.

3.6.2.5. Calibrated pressure gages and recording equipment shall be used during testing. Recorder graphs shall be signed, dated and made traceable to the equipment being tested.

3.7. OPERATIONAL REQUIREMENTS

3.7.1. General Operating Requirements

3.7.1.1. Equipment alone cannot prevent a blowout. Proper training and good operational practices are also required for safe operations. This Section sets forth the minimum requirements for training, certification and operational practices. If any difference exists between this document and any other state, federal or local operational requirements, the stricter requirement shall be adhered to.

3.7.1.2. A Rig Supervisor, Storage Field Engineer, or Contract Tool Pusher who has completed semi annual Gas Company BOPE safety training must be present at the rig site whenever the well is open to the storage zone and the crew is working.

3.7.1.3. Blowout prevention practice drills and training sessions shall be conducted at least once each week for each crew. Drills shall be noted on the Tour Sheet and in the Daily Activity Report and should include the nature of the training and the response time as applicable.

3.7.1.4. Training shall, minimally, ensure that rig personnel have:

3.7.1.4.1. A clear understanding of the purpose and method of operation of each preventer and all associated equipment.

3.7.1.4.2. Ability to recognize the warning signs that accompany a kick, and knowledge of the actions that should be taken when such warning signs exist.

3.7.1.4.3. A clear understanding of each crew member's station and duties in the event a kick occurs during any operation, including during drilling, tripping pipe, when drill collars are in the preventers and when pipe is out of the hole

3.7.2. Specific Operating Requirements

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3.7.2.1. Prior to Pulling Pipe from the Well

3.7.2.1.1. With the pumps shut down, determine if the well is flowing or losing fluid. If either is occurring, take appropriate action before pulling out of the well.

3.7.2.1.2. During drilling operations, the Driller shall make an entry on the Tour Sheet, prior to pulling out, regarding the status of the well; whether it is flowing, losing fluid or standing full.

3.7.2.1.3. During drilling operations, the drilling fluid density, along with the density and volume of any pills pumped, shall be noted prior to starting out of the well.

3.7.2.2. Pulling Pipe

3.7.2.2.1. When pulling pipe, the fluid lost due to the loss of pipe volume must be compensated for in a manner such that the bottom hole pressure (BHP) does not fall below the minimum safe over-balance pressure as determined by Section 3.4 of this document.

3.7.2.2.2. If fluid is added beyond the calculated displacement of the pipe or tools removed from the well, the Driller shall make an entry on the tour sheet detailing the amount of fluid added and amount of time over which the fluid was lost to the zone. This information will also be entered in the daily activity report.

3.7.2.2.3. The Driller will record the time, to the nearest minute, that the last pipe or tool was removed from the well.

3.7.2.2.4. In order to track the volume of fluid added to the well, the well shall not be filled continuously unless a trip tank is used.

3.7.2.2.5. If a well is open to a storage or production zone and is to be unattended overnight, a kill string shall be run into the well. The kill string shall be of adequate length such that the weight of the string is greater than the maximum possible upward force that may be exerted on it. The maximum upward force is determined by multiplying the cross sectional area of the kill string by the pressure exerted on it. The kill string shall have the safety valve

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installed and closed and the BOPE shall be closed on the kill string.

3.7.2.2.6. Choke and kill lines shall remain connected to the BOPE stack at all times when the well is open to a permeable zone.

3.7.2.2.7. During drilling operations a usable drill pipe or tubing pressure at high and low kill rate pump speeds shall be known at all times. A high rate is generally considered to be in the 3 - 4 BPM (Barrel Per Minute) and low kill rate speed is generally in the 1 - 2 BPM range.

- When drilling, determine the drill pipe pressure at the designated kill rate at least once per day. Record this information on the Tour Sheet and on the Daily Mud Report.

- During workover operations, determine the tubing pressure at the designated kill rate when the rig first moves onto the well, and whenever a change occurs that would affect the rate, such as a tubing, casing or pump change. Record this information on the Tour Sheet, post it at the rig site and record it in the Daily Activity Report.

3.7.2.3. Fluid Maintenance

3.7.2.3.1. If a reasonable possibility exists that a permeable zone may be encountered with pore pressures exceeding the BHP used for determining the minimum safe over-balance, weight material must be maintained at the drill site in sufficient quantity to increase the density of the drilling fluid by 5 lb./cf.

3.7.2.3.2. Drilling fluids shall be tested at least once per shift to determine viscosity and density. The results are to be recorded on the Daily Mud Report.

3.7.2.3.3. BOPE Operational Inspections

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All BOPE must be routinely inspected. The inspections must meet or exceed the D.O.G.G.R. requirements as specified in the D.O.G.G.R. manual *Blowout Prevention in California*, Sections 2 - 6. All inspections shall be logged in the Tour Sheet.

3.7.2.4. Emergency Operations

In the event of a kick, emergency actions should immediately be undertaken in accordance with established well control methods. At the first opportunity after immediate actions are completed, the **Storage Field Engineer** shall be notified in order to provide any assistance necessary and to be aware of the situation. All kicks are to be logged in the Tour Sheet and in the Daily Activity Report.

4. RECORDS

4.1. All BOPE tests are recorded on a pressure recording chart and kept by the Storage Field Engineer for the duration of the job.

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Blowout Prevention Equipment Configuration, Installation, Testing and Operation	SCG:	224.05

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Company Operations Standard

Operation of Underground Storage Wells	SCG:	224.02

PURPOSE **This document contains guidelines for the operation of underground storage wells. These guidelines are designed to ensure safety, efficiency and compliance with regulations as set forth in both Title 8, Division 1, Chapter 4, Subchapter 14 and Title 14, Division 2, Chapter 4 of the California Administrative Code. The intent is to ensure that all operating and downhole safety equipment used for the production of oil and gas is maintained in good condition to safeguard life, health, property and natural resources**

1. POLICY AND SCOPE

1.1. Storage operating personnel will operate, maintain and test all surface and subsurface well equipment to insure safe operations and compliance with all Company and state regulations

2. RESPONSIBILITIES

2.1. The **Storage Operations Manager** is responsible for all well operations.

3. DEFINITIONS

Not applicable

4. PROCEDURE

4.1. **Well Operations**

4.1.1. Well and operator identification

4.1.1.1. Each well location has a sign posted in a conspicuous place identifying the Company name, name or number of the lease, and the well name. A 24-hour emergency phone number is posted at the well location or field enclosure. In addition, any wells suspected of containing hazardous materials are identified as such.

4.1.2. Well safety devices for gas storage injection and/or withdrawal wells

4.1.2.1. Surface safety devices

4.1.2.1.1. Each well includes the following surface devices:

- Automatic fail-close valve installed in the wellhead withdrawal lines.

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- High-low pressure sensors installed in all flowlines to shut-in the well upon sensing abnormal pressures. High-pressure sensors are not required in any field equipped with flowlines rated to withstand the maximum reservoir pressure encountered under operating conditions.
- Fire detecting fusible plugs installed in pneumatic shut-in control lines at the wellhead.
- Remote, manually operated, quick operating shut-in controls located a recommended minimum of 100 feet from the wellhead.
- Sacrificial sand probes connected to safety valves and designed to shut-in flow from the well in case of excess sand production or corrosive fluid production. The probes should be at points with a high probability of erosion such as the automatic shut-in valve flange or the smallest diameter piping or fitting leaving the wellhead.

4.1.3. Testing and inspection of safety devices

4.1.3.1. All installed well safety devices are tested or inspected (under static conditions) semiannually. Semiannual inspections or tests are completed within the anniversary months established for each well. Testing includes the following:

4.1.3.1.1. Flowline pressure sensors tested for proper pressure settings.

4.1.3.1.2. Automatic wellhead safety valves tested for reliable operating and holding pressure.

4.1.3.2. Each **Storage Operations Manager** or designee maintains records of the present status and history of each installed safety device, as well as dates, details and results of inspections, tests, repairs, reinstallation, and replacements. These records are available to **the Division of Oil, Gas and Geothermal Resources** personnel during business hours.

4.1.4. Enclosures

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4.1.4.1. Facilities, oil and gas (including storage) wells are enclosed according to Company guidelines to prohibit or restrain access as necessary to protect life and property. Any site suspected of containing hazardous materials is identified at the enclosure. This is inclusive of the entire storage facility and is directed by the **Storage Operations Manager** or designee.

4.2. **Wellhead Valve Configuration**

4.2.1. Closing wellhead kill valves

4.2.1.1. Each storage / injection well has an operating and kill side. Normally, wellhead valves on the kill side remain in the open position. However, during wireline operations, preworkover preparation, or routine maintenance, the kill valves may be temporarily closed under the authority of the **Storage Field Engineer.**

4.2.1.2. The **Director of Storage, Storage Engineering Manager or Storage Operations Manager** approves closure of kill valves beyond these routine operations. If, under emergency conditions, these personnel are unavailable, the Region person on-call is responsible for authorizing kill valve operations.

4.2.2. Operating block valves and tubing master valves

4.2.2.1. Closing block valves located on the kill line prevents flow from the well through wellhead kill valves. These block valves are located a recommended minimum of 100 feet from the wellhead. Tubing master valves normally remain in the open position. However, these valves can be closed as needed for wireline or maintenance operations. During installation or removal of the wireline lubricator, the wellhead kill valve and the master valve should be closed during blowdown operations to minimize gas vented to the atmosphere.

4.2.3. Closure of wellhead valves

4.2.3.1. Wellhead valves containing wellhead pressure (e.g., remote kill valves) should never be left closed against the atmosphere. An end-closure device such as a tapped blind flange with a needle valve, or a unibolt is installed over the valve opening to provide a redundant seal.

4.2.4. Killed well valve configuration

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4.2.4.1. Before or after a workover, while the well is killed, the **Storage Field Engineer** is responsible for setting the configuration of the wellhead valves. The **Storage Field Engineer** ensures that provisions are made to prevent surface gas line pressure from exerting gas pressure on a killed well when such pressure applied on top of a column of kill fluid could potentially cause down hole casing damage. All surface piping that is connected to the wellhead should be vented while the well is full of fluid. During workover operations, the **Rig Supervisor** is responsible for the setting of all valves.

4.3. **Well Flow**

4.3.1. Producing the well from the kill side, with the exception of kill fluid unloading or temporary well testing operations, is allowed only if temporary piping is adequately protected with high and low pressure sensors and automatic shut-in valves are installed adjacent to the wellhead. During these temporary operations, provisions are made to kill the well through wellhead valves not involved in the flow.

4.4. **Sacrificial Probes**

4.4.1. When a sacrificial probe fails, the well is taken out of service and investigated to determine the cause of failure. The cause of failure should be diagnosed and corrected prior to returning the well to service.

4.5. **Critical Wells**

4.5.1. The following criteria define a "critical" well:

4.5.1.1. A well capable of flowing on its own and located within 300 feet of the following:

4.5.1.1.1. Any building intended for human occupancy that is not necessary for the operation of the underground storage facility.

4.5.1.1.2. Any airport runway.

4.5.1.2. A well capable of flowing on its own and located within 100 feet of the following:

4.5.1.2.1. Any dedicated public street, highway, or nearest rail of an operating railway.

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4.5.1.2.2. Any navigable body of water or watercourse perennially covered by water.

4.5.1.2.3. Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population.

4.5.1.2.4. Any officially recognized wildlife preserve.

4.5.1.3. Any other wells as designated by the **Division of Oil, Gas and Geothermal Resources**. Also, in certain cases the Gas Company may designate a well as "sensitive" due to safety or environmental concerns. These "sensitive" wells fall under the same operational guidelines set forth for critical wells, with the exception of the **Division of Oil, Gas and Geothermal Resources** reporting requirements.

4.5.2. Operation of critical wells

4.5.3. Besides the requirements set forth for all wells, critical wells are subject to additional operational requirements which include the following:

4.5.3.1. A surface controlled, subsurface safety valve installed at a depth of 50 feet or more below the ground level. For shut-in wells capable of flowing on their own, installation of a tubing plug can substitute for a subsurface tubing safety valve. If for any reason a subsurface safety valve is removed from a well, a replacement subsurface safety valve or tubing plug should be promptly installed. A packer is in place to seal the tubing/casing annulus at or below the valve or plug setting depth.

4.5.4. Testing and inspection of critical well safety devices

4.5.4.1. All installed well safety devices are tested or inspected (under static conditions) semiannually. Each semiannual inspection or test is completed within the anniversary months established for each well. Testing includes the following:

4.5.4.1.1. Subsurface safety devices tested for reliable operation.

4.5.4.1.2. Tubing plugs or packers tested for holding pressure.

4.5.4.2. The **Storage Field Engineer** or **Storage Operations Manager** notifies the **Division of Oil, Gas and Geothermal Resources**

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district office before tests are conducted. Test failures not immediately repaired or corrected and not witnessed by a **Division of Oil, Gas and Geothermal Resources** inspector should be reported to the **Division of Oil, Gas and Geothermal Resources** within 24 hours.

5. RECORDS

5.1. All pertinent data regarding well operations and wellhead conditions are collected and recorded on the station daily log or the daily gas withdrawal/injection data sheet. Sacrificial probes that have failed are inspected by the **Storage Field Engineer**. The **Storage Operations Manager** or designee also maintains records on sacrificial probe installation, failure and replacement.

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Company Operations Standard

Operation of Underground Storage Wells	SCG:	224.02

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PURPOSE **Gas Storage Operations monitors, verifies, and reports the gas inventory in underground storage reservoirs by following the methods identified in this gas standard.**

1. POLICY AND SCOPE

1.1. Gas Storage Operations require monitoring and inventory verification for safe long-term management of underground gas storage operations. While no single method can be used to precisely monitor and verify the gas inventory in underground storage reservoirs, the three engineering methods in general use are summarized in sections 4.1 – 4.3.8.1. Only combining and analyzing available field data can gas volume verification be obtained. Based on this analysis, gas volume changes or losses are recognized, estimated and reported.

2. DEFINITIONS

When gas storage operations are initiated in an oil or gas reservoir, there is an initial gas content in the reservoir prior to injection. Initial gas content is generally composed of both free gas and solution gas. Additional gas is added to the initial gas content by injection, and the combination comprises the Total Storage Volume. This volume is categorized as follows:

2.1. **Cushion Gas**

The volume of gas which is required in underground storage field to maintain minimum field pressure.

2.2. **Recoverable Cushion Gas**

This is defined as the volume of gas that can be economically recovered from the reservoir below the base gas pressure. This volume varies, depending upon economic conditions.

2.3. **Non-Recoverable "Cushion Gas"**

This is the volume of gas left in the reservoir after all recoverable gas volumes are removed and is not considered a part of Total Storage Inventory. This gas is capitalized and depreciated over the life of the project.

2.4. **Working Gas**

Volume of gas present in an underground storage field, which is available for withdrawal, although not all of the working gas may be utilized in a given year due to cycle volume constraints. This volume is in addition to the cushion gas volume.

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2.5. **Effective Working Gas**

This volume is defined as the working gas which is withdrawn and re-injected in a complete injection and withdrawal cycle. Ideally, the effective working gas volume is synonymous with the working gas volume. However, limitations by wells, compression facilities, or gas availability may limit effective working gas volume.

2.6. **Total Storage Inventory**

This is the sum of both the working and recoverable cushion gas volumes.

3. RESPONSIBILITY

The responsibilities for shut-ins, along with analyzing data, verifying gas inventory, and reporting changes or losses are specified in **Standard 224.0020,** *Gas Inventory Verification – Shut-In.*

3.1. At least once every two years the validity of the reported inventory for each storage field is evaluated using the methodologies outlined in this gas standard. A report is prepared that verifies that the reported inventory is within the range that would be expected from the reservoir analysis. Corrective action is taken if necessary. The report is prepared under the direction of the Storage Engineering Manager and approved by the Director of Storage. The report is directed to the **Director – Customer Billing Operations** and copied to the **Measurement Data Operations Manager** and the **Director – Transmission & System Operations**.

4. PROCEDURE

4.1. MONITORING

4.1.1. Monitoring of the storage reservoir ensure the reservoir functions, according to expectations, and integrity tests verify the gas inventory is present and available for delivery. Effective monitoring requires a thorough understanding of the reservoir system. This system is defined as the reservoir rock and wellbores, which respond to pressure changes as a result of gas injection and withdrawal.

4.1.2. Monitoring of the reservoir system is conducted in both storage and non-storage zone wells and at surface observation points.

4.1.2.1. Storage Zone Wells – Performance reviews utilize information collected during individual well and reservoir tests. Parameters such as back pressure curve shifts, changes in deliverability and field performance are investigated.

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4.1.2.1.1. Surface pressures on each well are measured and recorded weekly using a calibrated test gauge. These include tubing pressure, casing pressure, annuli pressures, and, if applicable, safety valve control line pressures. The mode of well operation (injection, withdrawal or shut-in) at the time of pressure measurement is also recorded. Note that the ***C.D.O.G.G.R. (California Division Of Oil, Gas, and Geothermal Resources)*** requires a monthly average casing and tubing pressure be submitted as part of the monthly production report.

4.1.2.1.2. A plot of the weekly surface casing and the innerstring annuli pressures versus time is maintained for each well. Hardcopy plots are created, marked and filed when an abnormal pressure is encountered. A pressure is considered abnormal when it may be large enough to force gas into a normally pressured water sand, either at the surface casing shoe or through any other known casing holes or leak-paths.

4.1.2.1.3. When abnormally high annular pressures are detected, diagnostic steps are taken to determine the source of pressure build up. This includes tests to eliminate surface valves and downhole tubing as possible sources of leakage. Zero pressure is abnormal in a well that has had a history of annular pressure and is investigated for the possibility of a closed valve.

4.1.2.1.4. All wells with continuing zero pressure readings are checked quarterly for closed valves and noted on the pressure plot. Blowdowns are also noted when they occur.

4.1.2.1.5. Wellhead inspections are performed on a monthly basis. Any leaks from wellhead flanges and valves are reported and corrected.

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4.1.2.1.6. Subsurface temperature surveys are conducted on each well in according to the following schedule: semi-annually in La Goleta and Playa del Rey storage fields and annually in the Aliso Canyon and Honor Rancho storage fields.

4.1.2.1.7. Surveys are done in accordance with CDOGGR regulations. Wells that have been killed are not exempt from this requirement and must be surveyed according to the schedule. Results of surveys are reported according to **Standard 224.001**, *Standardized Well Activities Reporting.*

4.1.2.1.8. Additional surveys will be run without regard to this schedule at the first indication of unusual or abnormal well conditions, i.e., anomalous pressure, surface gas emissions or other indications of well problems.

4.1.2.1.9. Wireline retrievable tubing obstructions such as tubing plugs, subsurface safety valves, subsurface chokes or tubing stops are removed once each year to perform a temperature survey of the casing shoe and cap rock seal. Ideally, this is done at high reservoir pressure when shoe leaks are most noticeable on temperature surveys. Under certain conditions it may not be possible or advisable to remove the wireline retrievable obstruction.

4.1.2.1.10. Subsurface surveys using wireline conductor cable equipment are made to investigate anomalies discovered by temperature surveys. Conductor cable surveys include temperature surveys, noise logs, spinner surveys, and radioactive tracer surveys.

4.1.2.1.11. In the case of well casing leaks above the shoe, radioactive tracer surveys are typically used to verify the location of gas movement through the leak. In the case of shoe or cap rock leaks, these additional surveys are used to verify that a leak exists and to qualitatively estimate a leakage rate.

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4.1.2.1.12. Gas cap observation wells are used to monitor reservoir pressure. If possible one or more wells completed in the gas cap are selected for observation purposes. These wells are not used for injection and are put on withdrawal only for peak load conditions. Surface pressure measurements on the tubing and casing of each gas cap observation well are made and recorded weekly.

4.1.2.1.13. A plot of these pressures versus inventory is kept in the office of the **Storage Field Engineer** and is updated weekly. Anomalous well pressures or behavior are reported to Storage Engineering Staff.

4.1.2.1.14. Reservoir shut-ins are generally on a schedule stated in **Standard 224.0020,** *Gas Inventory Verification – Shut-In* or when determined as necessary by the Storage Field Engineer.

4.1.2.2. Non-storage Zone Wells

Non-storage zone wells monitored include both Company wells and wells owned by others in overlying and underlying zones and in other fields within two miles of the storage reservoir boundary, where applicable. These wells are categorized as follows:

4.1.2.2.1. Pressure observation wells are located in overlying and underlying permeable formations, or adjacent to the storage reservoir but across assumed confining boundaries, such as faults, permeability pinchouts, below the gas-liquid contact or beyond the spill point of the storage zone's confining structure. Although normally static, these wells may have artificial lift mechanisms for removal of gas and fluids.

4.1.2.2.2. Gas collection wells are located where known gas migration from the storage zone is intercepted and collected. These wells are normally equipped with operating artificial lift mechanisms so that both liquids and gas can be produced, causing a pressure sink in the reservoir near the wellbore.

4.1.2.2.3. In some fields, shallow water observation wells have been drilled into aquifer zones existing in the first permeable sand above the shoe of the surface casing.

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These wells are shut-in at the surface and gas concentrations in the wellbore are measured weekly.

4.1.2.2.4. If gas loss is expected, performance reviews of wells operated by other producers in either overlying zones or in adjacent fields may be made by reviewing production reports from these operators.

4.1.2.2.5. Performance of Company-owned observation and collection wells are also closely monitored. Wellhead inspections and temperature surveys are performed on the pressure observation wells and the gas collection wells.

4.1.2.2.6. Pressure observation wells

- Surface pressures on all tubing and casing strings are measured weekly using a calibrated test gauge.
- A plot of pressure versus time for each well is kept by the Storage Field Engineer. Bottom-hole pressure surveys are run as needed on pressure observation wells.
- If a substantial increase in reservoir pressure is noted or a significant gas buildup occurs, an attempt may be made to produce the well. Produced gas is sampled and analyzed for both hydrocarbon and helium content.

4.1.2.2.7. Gas collection wells

- Surface pressures on all casing strings and safety valve control lines are recorded weekly using a calibrated test gauge. The mode of well operation (producing, shut-in) at the time of pressure measurement is also recorded.
- A plot of pressure vs. time for each surface casing and innerstring annulus is generated and kept by the **Storage Field Engineer**.
- Bottom-hole pressure surveys are run on gas collection wells as needed. These surveys follow a shut-in period to allow pressure

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stabilization after production. If the well is equipped with a standing valve, the valve is pulled prior to the bottom-hole pressure survey and is reinstalled upon completion of the survey.

- The Storage Field Engineer develops production schedules. The Storage Field Engineer maintains plots of bottomhole pressure versus time and records of produced gas, oil and water.

4.1.2.2.8. Shallow water observation wells

- Shallow water observation wells are closed-in at the surface and gas concentrations in the wellbore is measured periodically.

4.1.2.2.9. Surface Observations

- Surface observations are conducted by Station Personnel under the direction of local management and the resident Storage Field Engineer assigned to each Facility.

- Frequency and type of observations are determined and prescribed by local O&M procedures based on conditions particular to each Facility.

- In the event of major seismic activity or the occurrence of a significant gas loss or migration problem as identified by the Storage Field Engineer, local management with the assistance of the Storage Engineering Group will conduct inspections of certain well cellars, surrounding surface locations and previously abandoned wellbores as deemed necessary.

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4.2. BOTTOM-HOLE PRESSURE DETERMINATION

4.2.1. Each of the three major methods used to verify gas storage inventory, as explained in Section 5, requires the determination of bottom-hole pressures. The method used to determine bottom-hole pressure must be consistent from year to year. The most accurate method to determine bottom-hole pressure is to measure the pressure with a pressure bomb. In certain applications the bottom-hole pressure can be calculated from the shut-in wellhead pressure. For wells completed in the gas cap and having full gas columns, the bottom-hole pressure is calculated from the equation:

$$P_{BHP} = P_{WH} \exp\left(\frac{0.01875 \times SG \times D}{Z_{avg} T_{avg}}\right)$$

Where:

P_{BHP} = Bottom-hole pressure, psia.

P_{WH} = Wellhead pressure, psia.

SG = Gas specific gravity.

D = True vertical depth in feet.

T_{avg} = Average wellbore temperature between surface and bottom-hole, degrees Rankine.

Z_{avg} = Average gas compressibility factor from charts, tables or computer programs (dependent on P_{avg}, T_{avg} and gas gravity).

P_{avg} = Average pressure between surface and bottom-hole, psia or $P_{avg} = (P_{BHP} + P_{WH}) / 2$

NOTE: The above equation could yield incorrect results if the well exhibits a significant fluid level.

4.3. INVENTORY VERIFICATION – SHUT IN

4.3.1. Three primary methods for inventory verification of gas storage fields are referenced and summarized below:

4.3.1.1. Calculation of gas content based on volumetric data and average reservoir pressure; Volumetric Determination is explained in

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Applied Petroleum Reservoir Engineering; by Craft, B. C. and Hawkins, M. F.; Englewood Cliffs, N.J.: Prentice- Hall, 1959.

4.3.1.2. Calculation of effective gas content using the simple gas material balance, hysteresis curve, and P/Z curve methods; Material Balance is explained in Natural Gas Engineering by Ikoku, C. V.; Tulsa, Oklahoma: Penn Well Publishing, 1980.

4.3.1.3. Verification of storage inventory by comparing measured reservoir pressures with calculated pressures obtained using the single cell material balance or reservoir simulation methods; Numerical Simulation or Reservoir Modeling is explained in Modern Reservoir Engineering —A Simulation Approach by Crichlow, H. B.; Englewood Cliffs, N.J.: Prentice- Hall, 1977 and the Intercomp Beta II User Manual.

4.3.2. The most common inventory verification method used in mature gas storage projects that are known to have effective geologic closure is the hysteresis curve or P/Z versus inventory plot. Typically, it is adjusted annually for known gas losses and liquid production. Any shift between points plotted at similar pressures following a shut-in is further investigated.

4.3.2.1. Tracking known gas losses and transfers as they occur assist with inventory verification.

4.3.2.2. Recommended shut-in time durations for effective reservoir stabilization are listed below

4.3.2.2.1. Aliso Canyon -14 days

4.3.2.2.2. Honor Rancho -12 days

4.3.2.2.3. Goleta- 5 days

4.3.2.2.4. Playa del Rey – 4 days

4.3.3. Data collected during a shut-in period includes accurate measurements of reservoir pressure on each available well. Bottom-hole pressures can be calculated from surface pressures or measured directly. Gas gravity is determined using gas samples from individual, representative wells.

4.3.4. The **Storage Field Engineer** chooses the type and frequency of data to be collected during shut-ins.

4.3.5. Calculation of gas content based on volumetric data and average reservoir pressure from shut-in.

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4.3.5.1. Average reservoir pressures used in this calculation are obtained during shut-in periods required for reservoir pressure stabilization. Reservoir pore volumes available for gas storage are calculated from either geologic information, material balances using production and pressure information obtained during primary field production, or in some cases from pressure and production data obtained during gas storage operations. Elements of these calculations are described below:

4.3.5.2. Average reservoir pressures are calculated in an appropriate way for each storage reservoir. To be reliable, the method for each field should stay consistent for all years. Various methods of calculation include the following:

4.3.5.2.1. The average reservoir pressure for Honor Rancho, La Goleta, and Playa del Rey are determined by calculating the arithmetic average of the bottom-hole pressure in the gas cap wells. In these fields the pressure of each well is measured or computed at a specified subsea datum approximately at the midpoint of the zone. The datum and reservoir temperature used for these fields are as follows:

- Honor Rancho - 8,300 feet subsea, 190°F
- La Goleta - 4,200 feet subsea, 150°F
- Playa del Rey - 6,100 feet subsea, 210°F
- A volumetrically weighted average reservoir pressure is used for Aliso Canyon. The pressures in this field are computed at a specified subsea depth approximately at the midpoint of the zone. The datum depth for this field and the reservoir temperature are as follows:
    - Aliso Canyon - 5,400 feet subsea, 180°F

4.3.6. Reservoir pore volume calculated from geologic information uses data obtained during the drilling and completion of the well, such as electric logs or core information to calculate the total pore volume of the reservoir. These calculations are based on the following equations:

4.3.6.1. Gas reservoirs

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4.3.6.1.1. Equation: $V = Ah\phi (1-S_w)$

Where:

V = Reservoir gas pore volume in cubic feet

A = Gas zone area in square feet

h = Average gas zone thickness in feet determined from electric logs or cores

ø = Porosity fraction determined from porosity logs or core analysis

S_w = Water saturation from log, core analysis

4.3.6.2. Oil reservoirs

4.3.6.2.1. Equation: $V = Ah\phi(1-S_w) + A_1h_1\phi (1- S_{1w}-s_o)$

Where:

A = Primary gas cap area in square feet

A_1 = Secondary gas cap area in square feet

h_1 = Average secondary gas zone thickness in feet

s_o = Residual oil saturation

4.3.6.2.2. In most portions of an oil zone storage reservoir, oil saturation is determined from core analysis or can be considered equivalent to residual oil saturation and can be estimated from the 16" normal resistivity curve using the following relationships.

Equation: Residual oil saturation = $(1-s_{xo})$

$$s_{xo} = \sqrt{\frac{Rmf}{R_{xo}\phi 2}}$$

Where:

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R_{xo} = Resistivity of 16" normal or resistivity of flushed zone.

S_{xo} = Water saturation of mud filtrate within the flushed zone.

ø = Porosity

Rmf = Resistivity of mud filtrate.

4.3.6.3. Gas reservoir pore volume calculated using material balance equations:

These calculations utilize production and pressure data in the following equations:

4.3.6.3.1. Equation for constant volume gas reservoirs using primary production:

$$V = \frac{P_{SC} G_P T}{T_{SC}} \left(\frac{1}{P_i / Z_i - P_f / Z_F} \right)$$

Where water production and influx are assumed negligible and where:

V = Gas pore volume in reservoir cubic feet.

P_{sc} = 14.7 psia

G_p = Gas produced in standard cubic feet.

T = Reservoir temperature in degrees Rankin (°R).

R_{sc} = 520°R

P_i = Initial pressure, psia.

P_f = Final pressure, psia.

Z_i = Initial gas compressibility factor.

Z_f = Final gas compressibility factor.

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4.3.6.3.2. Equation for constant volume gas reservoirs using storage production

$$V = \frac{P_{SC} G_P T}{T_{SP}} \left(\frac{1}{P_1 / Z_1 - P_2 / Z_2} \right)$$

Where water production and influx are assumed negligible

G_p = SCF of gas produced or injected between pressure points P1 and P2.

P1 and P2 = The first and second stabilized average reservoir pressures bounding the production or injection period considered.

Z1 and Z2 = Gas compressibility factors for P1 and P2.

T = Reservoir temperature in degrees Rankine

4.3.6.4. Oil reservoirs pore volume calculations

4.3.6.4.1. Equation: The 'Reservoir Gas Pore Volume' is equal to the 'Original Gas Cap Pore Volume' plus the 'Secondary Gas Cap Pore Volume' plus the 'Space created by Water Production'.

Or:

$$V = GB_{gi} = \left(NB_{oi} - \left(N - N_p \right) B_o \right) + W_p B_w$$

Where:

G = Original gas pore volume, standard cubic feet (determined from either geologic data or an appropriate form of the material balance equation).

B_{gi} = Gas formation volume factor in reservoir cubic feet per standard cubic feet at discovery pressure.

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N = Initial oil in place in stock tank barrels (determined from either geologic data or an appropriated form of the material balance equation).

N_p = Cumulative oil production in stock tank barrels.

B_{oi} = Oil formation volume factor in reservoir cubic feet per stock tank barrel at discovery pressure.

Bo = Oil formation volume factor at existing pressure in reservoir cubic feet per stock tank barrel.

W_p = Water production in stock tank barrels.

B_w = Water formation volume factor, reservoir cubic feet per stock tank barrel (approximates 5.615).

4.3.6.4.2. Simplifying assumptions used in the above equation are that no storage gas goes into solution in the oil and that there is no water influx into the storage reservoir. These simplifying assumptions are seldom true. However, the equation can be modified based on a judgment of the volume of gas which may go into solution in the reservoir oil and a judgment of aquifer activity surrounding the storage reservoir. When modified by these judgment factors, the equation provides a method for approximating a limit for the reservoir gas pore volume available for storage operations. An upper limit is established when it is assumed that all the residual oil is re-saturated with gas. Generally, only a fraction of the oil becomes saturated and so the calculation has little usage beyond setting limits.

4.3.6.4.3. The values of G and N are not generally expected to be obtained with an accuracy greater than +/- 20%. However, this is not a major drawback since the methods are used to establish guidelines and set limits.

4.3.6.5. Calculation of gas content.

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4.3.6.5.1. After the gas pore volume has been calculated, or approximated, by one of the methods indicated above, the gas content at the measured reservoir pressure is determined using the gas law as follows:

PV = ZNRT

Where:

P = Average reservoir pressure, psia

V = Gas pore volume in reservoir cubic feet

T = Temperature of reservoir, (°F + 460) degrees Rankine

Z = Compressibility factor, dependent on P, T, and gas gravity, from charts or tables.

N = pound moles (where one pound mole =379.41 cubic feet @ 60°F and 14.7 psia).

R = 10.735 universal gas constant for above units.

Solving for gas content;

$$Volume(mscf) = \frac{(0.03533)PV}{ZT}$$

4.3.7. Calculation of effective gas content using the simple gas material balance and hysteresis curve (P/Z curve) methods.

4.3.7.1. Pressure changes, with rapid gas injection or withdrawal during selected operating periods, can show the relationship between effective gas content and the storage inventory. Effective gas content is the gas which, within a given time, causes a measurable pressure response to injection or withdrawal operations. Not all gas in the reservoir yields such a response within the given time interval. The difference between effective gas content at a given pressure (P_1) and the metered inventory is non-effective gas. Part of this non-effective gas can be due to the lack of pressure equilibrium within the reservoir. Any gas migration out of the storage reservoir also contributes to the non-effective gas. Either one of the two equations, or the graphical solutions presented below are used to calculate the effective gas content.

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4.3.7.1.1. Calculations with negligible water movement are made using the following equation:

$$\text{Effective Gas Content at P1, Q1} = \left(\frac{\Delta Q}{\frac{P_1}{Z_1} - \frac{P_2}{Z_2}} \right) \left(\frac{P_1}{Z_1} \right)$$

Where:

P_1 = Pressure at the first operational point considered.

P_2 = Pressure at the second operational point considered.

Q_1 = Net storage volume at the first operational point considered.

ΔQ = The net change in gas inventory between the two operational points considered.

4.3.7.1.2. Calculations with significant water movement of a known rate are made using the following equations:

$$Q_1 = \left(\Delta Q - \left(We \times \frac{P_2}{14.7} \times \frac{520}{T_R} \times \frac{1}{Z_R} \right) \right) \frac{\frac{P_1}{Z_1}}{\left(\frac{P_1}{Z_1} - \frac{P_2}{Z_2} \right)}$$

Where terms are defined as above, and where:

We = Water influx in cubic feet.

T_R = Reservoir temperature, degrees Rankine.

Z_R = Z at T_R and P_2.

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4.3.8. Graphical solutions

4.3.8.1. The hysteresis curve is a plot of reservoir pressure versus storage inventory. This curve utilizes the compressibility factor of non-ideal gas. It is most effective in a constant volume reservoir since it assumes no water movement into or away from the storage reservoir; and no movement of gas into or out of solution in the reservoir oil. Actually, after sufficient storage history, the hysteresis curve becomes a qualitative/quantitative tool for inventory when a storage field is operated in a consistent manner and storage cycle volumes are relatively consistent over time. Under these conditions, aquifer movement and movement of gas into and out of solution is relatively constant and effectively drops from the equation.

4.4. REPORTING GAS INVENTORY LOSSES

4.4.1. Calculated operational losses

4.4.1.1. Gas losses due to compressor, piping system or well blowdowns and wireline surveys are calculated by Storage Operations personnel and reported to Measurement monthly. These reports are reviewed by the Storage Field Engineer.

4.4.1.2. Estimates of losses related to workovers and well blowdowns are prepared by the Storage Field Engineer after a well has been killed. These estimated losses are reported monthly to Gas Measurement.

4.4.2. Losses from known well and surface facility leaks

4.4.2.1. Some small losses from valves, compressors, field piping, threaded well casing connections and well casing mechanical devices such as cementing stage collars, and some small casing leaks are inherent to **Storage Field Operations**. These leaks are estimated and reported as follows:

4.4.2.1.1. Minor surface facility leakage is surveyed in each storage field periodically. Leakage surveys include wellhead valves and fittings, instrumentation, well piping, field piping, surface production facilities and the compressor station. Surveys are made more frequently if facility modifications are made which might change leakage rates.

4.4.2.1.2. During these surveys, measurements are obtained on representative minor atmospheric leaks and then

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extrapolated to an estimated annual leakage rate for the field.

4.4.2.1.3. Subsurface leakage from wells is estimated by the **Storage Field Engineer** and reported to **Storage Engineering Staff.**

4.4.2.1.4. Leakage from well casings is estimated by establishing a leakage rate using the radioactive tracer survey. The number of days of leakage is estimated by using subsurface temperature survey data. Casing shoe or Water Shut-Off (WSO) leakage is estimated by reviewing temperature, noise and radioactive tracer surveys, pressure draw-down and the overlying wells' gas production during the time of the leak.

4.4.2.1.5. In cases where leakage rates are not quantifiable, an average rate of 30 Mcf/d may be used. Engineering judgment is then applied and an average daily loss rate selected. The number of days the leak was occurring is determined by taking one-half the difference in the number of days between the last normal and the first abnormal temperature survey.

4.4.2.2. Surface facility leakage and subsurface leakage are quantified annually by the **Storage Field Engineer** who reports the results to the **Storage Engineering Manager** and **Measurement Data Operations**.

4.4.3. Reservoir losses

4.4.3.1. Reservoir losses are categorized as those associated with Company-operated wells completed in the storage reservoir and general reservoir losses.

4.4.3.1.1. Losses associated with the Company-operated wells include losses through failures in the cement between the cap rock and well casing. These losses are also known as "shoe leaks," "WSO" leaks and "stage collar" leaks.

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4.4.3.1.2. General reservoir losses include losses through abandoned wells or breakdown of some portion of the trapping mechanism. This type of loss is not directly detected by surveys of Company-operated wells in the storage zone.

4.4.3.1.3. Quantification of reservoir losses utilizes industry accepted methods of inventory verification.

4.4.4. Reservoir losses are quantified annually by the **Storage Field Engineer** who reports results to the **Storage Engineering Manager** and **Measurement Data Operations.**

4.4.5. Gas storage field measurement audits

4.4.5.1. When Storage Engineering identifies a consistent discrepancy in the pressure or P/Z versus Inventory relationship of 1 Bcf or 3% of the working inventory volume, whichever is less, at a storage field that cannot be explained by known leaks such as gas vented to the atmosphere, liquid production or other reservoir changes, they request an audit of the gas measurement systems at the storage field by the Measurement, Regulation and Control (MRC) group of Gas Engineering.

4.4.5.2. MRC investigates the following parameters with assistance from Storage personnel.

4.4.5.2.1. MRC Design Team obtains the most current drawings and block flow diagrams for the storage field.

4.4.5.2.2. MRC Design and Storage Field personnel inspect the facility to determine the accuracy of current drawings.

4.4.5.2.3 MRC Design and Storage Field personnel identify any changes in metering or gas processes that have occurred since the drawings were last issued.

4.4.5.3 MRC reviews Storage Field Ledger calculations in order to verify they agree with updated drawings and block flow diagrams. MRC documents any errors found in the Ledger formulas and advised MDO of any required Ledger formula revisions.

4.4.5.4 MRC in conjunction with the drawing confirmation prepares a list of the meters, instrument configuration and associated transducer ranges.

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4.4.5.4.1 MRC compares this listing to information in the Measurement Collection System (MCS) for those sites that MCS re-calculates the volumes and notes any discrepancies and impact of those discrepancies on measurement accuracy.

4.4.5.4.2 MRC compares information in the Instrument Configuration for those site where the Scada Pack calculates the volumes and notes any discrepancies and impact of those discrepancies on measurement accuracy.

4.4.5.5 MRC Measurement Technology reviews Storage Field calibration and meter inspection results to insure adherence to the Gas Standards and System Instructions listed below. Any discrepancies or errors will be documented and impact on measurement noted.

- **Standard 223.0360** Instrument Maintenance – Storage Field and Transmission Facilities
- **Standard 185.0455** Flow Measuring Devices – Field Maintenance
- **Standard 185.0475** Orifice Meters and Orifice Plates - Field Inspection and Maintenance
- **Form 4682-B** Orifice Meter Order
- **Standard 185.0452** Daniel Ultrasonic Meter - Operation and Maintenance
- **Standard 185.0425** Rotary Meters - Field Maintenance, Inspection and Repair
- **Standard 185.0530** Turbine Meters - Operation, Maintenance and Spin Test
- **Standard 185.0474** Control Microsystems SCADAPACK
- **Standard 185.0457** Totalflow Inspection and Calibration Requirements for 6610, 6413, 6713 & X-Series
- **Standard 185.0458** Totalflow Inspection and Calibration Requirements for 6611, 6414, 6714 & X-Series
- **Standard 185.0461** Galvanic Gas Micro - Installation and Field Maintenance
- **Standard 185.0515** Temperature Devices – Maintenance

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4.4.5.6 Storage Field Orifice Meter or Ultrasonic Meter (USM) inspections will be witnessed by MRC Measurement Technology to confirm conformance to applicable Gas Standards listed in Section 4.4.5.5. A borescope inspection may be recommended if metering inspection results warrant further investigation.

4.4.5.7 MRC Measurement Technology to review the last 12 months of MCS Hourly data for each Storage Field Meter on the Ledger to verify meters are operating within their minimum and maximum ranges.

4.4.5.7.1 Verify operating Orifice Differential Pressure (DP) are 9" w.c. or greater on average, Beta ratio within the range of 0.2 to 0.6 and orifice plate thickness and bevels in accordance with AGA 3

4.4.5.7.2 MRC Measurement Technology will also review borescope inspection results. Impact on measurement accuracy will be noted for any negative findings.

4.4.5.8 MRC Technology to issue final report to Storage Field, MRC and MDO summarizing all findings, quantifying all measurement errors and detailing any revisions required to MCS Ledgers or Company Drawings.

4.4.5.8.1 Report will also recommend any follow-up actions required by Storage Field, MRC Design or MDO.

4.4.5.9 The final report results are reviewed and signed off on by:

- Director of Storage
- Storage Engineering Manager
- Storage Operations Manager
- Measurement Regulation and Control (MRC) Manager
- Contract and Compliance Manager - Measurement Data Operations (MDO)
- Storage Technical Services Manager (TSM)

5. RECORDS

5.1. Surface Pressure Taken during Shut-in., P/Z Calculations and Plots are maintained as records. Retention of all records is in accordance with Sempra Energy's company policy.

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Brief: Streamlined gas leakage survey and detection procedure from a fixed frequency to per field's individual need and per direction of local management and Storage Field Engineer. (4.1.2.2.9)

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Message

From: Baker, Phil E. [PBaker@semprautilities.com]
Sent: 10/24/2015 6:39:06 PM
To: Lane, Bret [JLane@semprautilities.com]
CC: Furgerson, Scott P [SFurgerson@semprautilities.com]
Subject: Fwd: Aliso Canyon - Standard Sesnon 25 - Wellhead Leak - Brief Summary
Attachments: SS-25Wellschematic.pdf; ATT00001.htm

Bret, we are having an issue with a well leak on SS 25 at Aliso. We tried to kill the well earlier today but were unsuccessful. Todd is calling out some additional expertise as described below. I am heading back home from Lee"s to better monitor the situation. Please call me on my cell or Todd directly for more information.

Scott has been informed all along.

Sent from my iPhone

Begin forwarded message:
From: "Van de Putte, Todd" <TVandePutte@semprautilities.com>
Date: October 24, 2015 at 6:25:36 PM PDT
To: "Baker, Phil E." <PBaker@semprautilities.com>
Cc: "Furgerson, Scott P" <SFurgerson@semprautilities.com>
Subject: Aliso Canyon - Standard Sesnon 25 - Wellhead Leak - Brief Summary
Hi Phil,

Here's the current overview/summary of the work accomplished to date (it's a bit of a blur but here it is as best I can do at the moment and I'm sorry if this is too wordy):

10/23/15 (late afternoon): Ops notified/Storage Engineering of a well that was possibly leaking at the SS-25 site. Ops had been on injection that afternoon and they were shutting in. The ops noticed that SS-25 sounded like it was still flowing after being shut-in after injection and they noticed a gas odor on the east side of the well pad along the road at the location. The SS-25 well had no anomalous pressure readings tubing/casing or surface casing prior to that day. No wells in the vicinity of the SS-25 wellsite or the other two wells on the SS-25 site (SS-25A and SS-25B) are currently or were showing elevated surface casing pressures or any unusual pressures from the previous days.

10/23/15 (evening) Met with Ops and Storage Engineering to discuss a plan of attack. The initial plan was to gather the equipment, Halliburton pump truck and brine to plan on killing the well. All of that equipment ultimately arrived on location by 11:00am today (10/24/15).

In the meantime, we suspected the wellhead seals were leaking (as in a top down leak) based on the sounds at the wellhead, a cool to the touch wellhead and a slightly elevated surface casing pressure (140 psig). Cameron wellhead was called out this morning to test and verify the wellhead seal integrity. The primary and secondary wellhead seals were pressure tested to 1600 psig and they bled to 600 psig. Injected plastic packing into the primary seal void and pressure tested the seals to 2200 psig and it held at 1800 psig. There was still audible noise at the wellhead with all the wellhead valves closed.

Well Kill Activity (today): The plan was to pump a polymer pill down the tubing to kill the reservoir and then perform a standard brine well kill. The well currently has an old disabled Camco subsurface safety valve system in the 2-7/8" tubing string place and a Gas lift mandrel above it in the tubing string.

Current Kill Job summary:

SS-25 Well Pressures Prior to Kill: 11-3/4" surface casing: 140 psig / 7" production casing: 290 psig / 2-7/8" completion tubing: 1700 psig

Activity during the well kill: Pumped 11 bbl of 10 ppg XC polymer pill down the 2-7/8" tubing. The tubing pressured up to 3500 psig surface pressure. Shut down the pump. The 7" casing pressure remained at 290 psig surface pressure indicating no communication between the 2-7/8" tubing and the 7" casing annulus.

Decided to perform a "Pump and Bleed" kill procedure on the 7" production casing annulus to fill the tubing/casing annulus. Began pumping @ 3 bbl/min w/ the casing pressure at 290 psig. Pressure on the 7" casing began to drop with 45 bbl of 8.6 ppg brine away. The pressure on the 7" production casing dropped to 250 psig surface pressure. Increased the pump rate to 4 bbl/min. Inspected the wellhead – noise and vibration stopped. Inspected the well location looking for any brine communication to the surface (none seen). Continued to pump and at 89 bbl of brine pumped into the annulus and additional gas flow was noted in cracks in the ground. Immediately shut the pump down – Monitored well pressures and the location.

SS-25 Well Pressures After Kill Attempt (10-24-15-Monitoring):

Time	11-3/4"	7"	2-7/8"
4pm	398 psig	280 psig	100 psig
4:30pm	401 psig	296 psig	140 psig
5pm		306 psig	185 psig
5:30pm		307 psig	200 psig

We currently have the Baker tank, and the Halliburton pump truck parked next to the remote kill header on the location.

At this time, It appears that we had a wellhead seal leak and/or a very shallow 7" production casing leak. While on injection, the leak(s) possibly charged up the 11-3/4" surface casing annulus. The well pad has various spots with venting cracks which are probably allowing the gas bubble in the 11-3/4" surface casing and/or the 7" production casing to vent. We stopped pumping brine into the well in order to allow the gas bubble to subside and to not take the chance of increasing the surface pressure any further. At the moment we are monitoring the location to see if we see a decrease in the venting gas. In the meantime, I would like to get another opinion from Boots and Coots and have them review the situation to see if there are any additional recommendations to remedy the situation. As the well is acting very odd at the moment, I do not want to aggravate the situation....

Todd R. Van de Putte
Drilling Manager

Storage Operations/Engineering
Southern California Gas Company
[redacted](Cell)

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SS25 Well Pressures

Ref #	Date	Time	Casing Pressure	Tubing Pressure	Surface Csg	Events	Notes
1	Normal Operation		2700	2700	Should be Zero	Well normally operates on casing injection and casing WD. It may be operated on dual flow	Well on injection - heard noise in wellhead
2	Friday, October 23, 2015	4:00 PM	270	1700	140	Ops noticed leaking Annulus fitting on well. They responded by closing 2 inch surface annulus valve and noticed 140 psi on gauge	When Ops closed injection header valve, the WKM SSV on casing closed almost immediately by low pressure pilot (setpoint is 270-300 psi). It was at that time Ops noticed sound of gas flow in wellhead.
3	Friday, October 23, 2015	4:10 PM	270	1700	140	Well shut-in by Ops	We initially suspected an up/down wellhead seal leak between the 7 inch casing and he 11-3/4 surface casing - Called Cameron
	Saturday, October 24, 2015	6:00 AM	270	1700	140	Cameron began repairing wellhead seals	Cameron initially tested both seals to 1200 psi, both bled down to 600. They then pumped 14 tubes of plastic into primary seal cavity.
4	Saturday, October 24, 2015	12:27 PM	290	1700	140	Haliburton circulating down tubing	Pumped 11.8 barrels of 10# polymer brine. Pressure on tubing rose to 3500. Shut down. 7 inch casing pressure remained at 290. Surface casing remained at 140. Monitored tubing pressure for 20 minutes. Tubing pressure bled to 2700.
	Saturday, October 24, 2015	2:00 PM	290	2700		Decided to pump and bleed down 7 inch casing to fill casing using 8.6# lease water.	
	Saturday, October 24, 2015	1:20 PM				Shut in tubing with 2700 psi on it	
	Saturday, October 24, 2015	1:30 PM		50		Put the well on Tubing flow to frac tank for few mintues and bled tubing down to 50 psi	
5	Saturday, October 24, 2015	2:07 PM	290	50	140	Haliburton began pumping 8.6 lb lease water down 7 inch casing	Started pumping 8.6# lease waster at a rate of 1.5 b/m. At 20 barrels increased rate to 2.5 b/m , at 33 barrels increase to 3.5 b/m, Began monitoring location for gas. Inspected the wellhead, noticed the noise and vibraton had subsided. Continuted pumped. At 89 barrels gas broke through surface at location and surrounding location. Continuted Monitoring
	Saturday, October 24, 2015	2:30 AM	400			When we shut down after 89 barrels and gas came to surface and we shut down, 7 inch casing pressure increased to 400 psi	
6	Saturday, October 24, 2015						
7	Saturday, October 24, 2015	5:00 PM	306	177			
8	Saturday, October 24, 2015	5:23 PM	307	200			
9	Saturday, October 24, 2015	5:30 PM	309	210			
	Saturday, October 24, 2015	5:40 PM	310	218			
	Saturday, October 24, 2015	5:50 PM	311	226			
	Saturday, October 24, 2015	6:00 PM	312	232			
	Saturday, October 24, 2015	6:10 PM	314	239			
	Saturday, October 24, 2015	6:30 PM	316	251			
	Saturday, October 24, 2015	7:00 PM	318	262			
	Saturday, October 24, 2015	7:30 PM	322	274			
	Sunday, October 25, 2015	8:45 AM	377	616	450		
		3.00	401	674	459		

4-10 Bbls to tbg

11.8

150

SED SUR_REPLY_001314

AC_CPUC_SED_DR_30_0000776

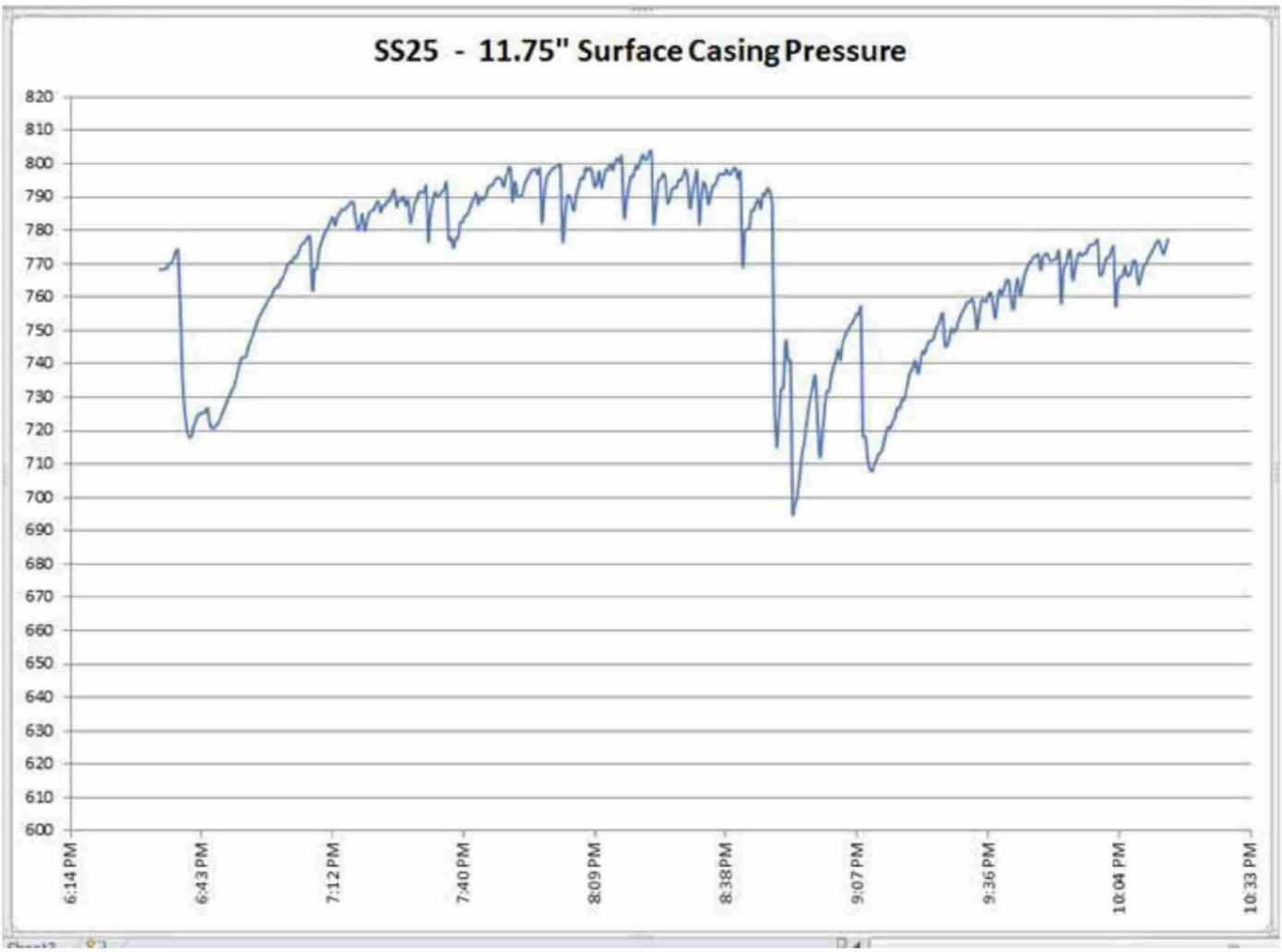
Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Message

From: Egbert, Thomas [TEgbert@semprautilities.com]
Sent: 10/30/2015 10:26:19 PM
To: La Fevers, Glenn [GLaFevers@semprautilities.com]; Baker, Phil E. [PBaker@semprautilities.com]; Lane, Bret [JLane@semprautilities.com]; Van de Putte, Todd [TVandePutte@semprautilities.com]; Kitson, Amy [AKitson@semprautilities.com]
Subject: Surface Casing Pressure trend

The pressure transmitter was activated at 6:30 pm. Since then, the surface casing pressure appears to be regulating itself between 700 & 800 psi.

I'll continue to keep an eye on it.



Thomas Egbert

Senior UGS Engineer.

SoCal Gas Co. - Aliso Canyon

Office: 818-368-3607

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

[redacted]

From: La Fevers, Glenn
Sent: Friday, October 30, 2015 8:44 PM
To: Baker, Phil E.; Lane, Bret; Van de Putte, Todd; Egbert, Thomas; Kitson, Amy
Subject: FW: Miller OT

Remote pressure monitoring of SS25 is now available in PI.

From: Brewer, Todd R.
Sent: Friday, October 30, 2015 7:55 PM
To: La Fevers, Glenn; Garchev, Oleksiy
Subject: Fwd: Miller OT

FYI

Sent from my iPhone

Begin forwarded message:

From: "Miller, Russell L." <RLMiller@semprautilities.com>
Date: October 30, 2015 at 7:53:51 PM PDT
To: "Brewer, Todd R." <TBrewer@semprautilities.com>
Subject: Miller OT

Hi Todd,

I worked 5hrs OT today, 10/30/15 from 3-8pm on installing wireless transmitters and repeater batteries and remounted gateway antenna @ Sesnon FW Pump location with JT.

SS-25 is online and in Pi !

Thx,

Russell Miller

Instrument Specialist

Aliso Canyon Storage Field

Ofc 818 700-3614

E-mail rlmiller@semprautilities.com

SAN DIEGO GAS AND ELECTRIC COMPANY
SOUTHERN CALIFORNIA GAS COMPANY
2009 BIENNIAL COST ALLOCATION PROCEEDING (A.08-02-001)
28th DATA REQUEST FROM SOCAL GENERATION COALITION (SCGC-28)

QUESTION 28.1:

28.1. Regarding the Southern System Reliability Request for Offers ("RFO") dated December 1, 2008:

28.1.1. Did SoCalGas receive any proposals by the December 19, 2008 deadline? If so, how many?
28.1.2. Did SoCalGas notify "short-listed" bidders and begin negotiating binding offers and final agreements on January 9, 2009? If so, how many "short-listed" bidders are there?
28.1.3. Does SoCalGas anticipate that it will be able to meet the February 2, 2009 target date for filing an advice letter for approval of Southern System minimum flow agreements?
28.1.4. Offers were to be sent to Gwoon Tom. Is Mr. Tom also involved in the sale of unbundled storage services under Schedule G-TBS?

RESPONSE 28.1.1:

Yes. We have received responses from 11 different parties.

RESPONSE 28.1.2:

Yes. We short-listed all bidders.

RESPONSE 28.1.3:

Our current plan is to file by February 2. However, depending on negotiations and final contracts, that date could be delayed.

RESPONSE 28.1.4:

Yes.

QUESTION 28.2:

28.2. Regarding the sale of System Operator HUB services:

28.2.1. By what date does SoCalGas expect to start commencing the sale of such services?
28.2.2. Will Mr. Tom be involved in the sale of the HUB services in addition to the sale of the unbundled storage services under Schedule G-TBS?
28.2.3. Does SoCalGas regard the sale of unbundled storage services to be a System Operator function?
28.2.4. Does SoCalGas regard the sale of HUB services to be a System Operator function?

RESPONSE 28.2.1:

The SoCalGas advice Letter 3818-A which included the G-PAL tariff was approved by the Commission on June 18th and SoCalGas began offering G-PAL services in July 2008. (Response to SCGC Data Request 22.7)

RESPONSE 28.2.2

Yes.

RESPONSE 28.2.3:

The term System Operator is the same as "Utility System Operator" that was used during the proceedings that resulted in D.07-12-019., and was intended to separate for discussion purposes, the various functions within SoCalGas that provided service to customers, specifically excluding the Utility Gas Procurement function. The shorten term "System Operator" that many parties seem to use, should not be used as a literal term. The term "Utility System Operator" is defined in SoCalGas Rule 1 (approved within Advice Letter 3818-A) reads as follows:

> Utility System Operator: The applicable departments within Southern California Gas Company and San Diego Gas & Electric Company that are responsible for the physical and commercial operation of the pipeline and storage systems specifically excluding the Utility Gas Procurement Department.

Therefore, based on this definition, Storage and Hub Products sales are within the definition of Utility System Operator. To make it clear, the daily (24/7) system operations of the SDG&E/SoCalGas transmission pipelines is solely the responsibility of the Utility's Gas Control Department.

RESPONSE 28.2.4:

See response 28.2.3.

QUESTION 28.3:

28.3. By what date will the System Operator assume Southern System reliability responsibility from the Gas Acquisition Department?

RESPONSE 28.3:

As defined in SoCalGas' approved Advice Letter 3818-A, April 1, 2009. (Response to SCGC Data Request 21.5.6)

QUESTION 28.4:

28.4. By what date will the SRMA become effective?

RESPONSE 28.4:

Please see response 28.3.

QUESTION 28.5:

28.5. By what date will SoCalGas implement the core balancing rules approved in D.07-12-019, including the monthly imbalance tolerance?

RESPONSE 28.5:

Please see response 28.3.

QUESTION 28.6:

28.6. By what date will SoCalGas implement the fifth nomination cycle approved in D.07-12-019?

RESPONSE 28.6:

April 1, 2009.

QUESTION 28.7:

28.7. Please provide organization diagrams that specifically identify all SDG&E/SoCalGas departments that are included in the Utility System Operator and identify their function within the System Operator.

RESPONSE 28.7:

The "System Operator" term should be considered in the same context as the defined term Utility System Operator and is not meant to describe a separate function within the Utility. Therefore all departments have been defined to be in the Utility System Operator, except the Gas Procurement Department.

SoCalGas objects to this question because it seeks confidential and proprietary trade secrets of SoCalGas. It would cause substantial harm to SoCalGas and its customers, and potentially compromise the security of the SoCalGas system, if this information were to be publicly disclosed. Without waiving these objections, and subject thereto, SoCalGas responds as follows: The daily overall physical transmission and storage system reliability operations within the Utility System Operator are conducted by the existing Gas System Operations under Ms. Gina Orozco-Mejia. Other departments assist in ensuring the operational reliability of the pipeline system of which many are located in the Gas Operations Organization under Mr. Lee Stewart. The activities involved in obtaining any physical flowing gas supplies needs determined by the Gas System Operations would be conducted in the Storage and Hub Products group within the Energy Markets and Capacity Products department under Mr. Rodger Schwecke. The Energy Markets and Capacity Products department is located in the Customer Services Organization under Mr. Rick Morrow.

QUESTION 28.8:

28.8. Are the following descriptions of the System Operator that were provided in response to data requests SCGC-06 and SCGC-07 in A.06-08-026 still accurate? If not, please make any corrections that are necessary to make the descriptions accurate.

Question 6.1

In response to SCGC Data Request Question 3.3.3, which asked: "Please identify the group(s) within SDG&E/SoCalGas that would be identified as the System Operator," SDG&E/SoCalGas responded: "Please see SoCalGas filed "Rule 1, Definitions" which is attached to A.06-08-026 as Appendix T."

Rule 1 defines the Utility System Operator as "The applicable departments within Southern California Gas Company that are responsible for the physical and commercial operation of the pipeline and storage systems specifically excluding the Utility Gas Procurement Department."

6.6.1. Please provide organization diagrams that specifically identify all SDG&E/SoCalGas departments who are members of the Utility System Operator.

RESPONSE 6.1.1:

SoCalGas objects to this question because it seeks confidential and proprietary trade secrets of SoCalGas. It would cause substantial harm to SoCalGas and its customers, and potentially compromise the security of the SoCalGas system, if this information were to be publicly disclosed. Without waiving these objections, and subject thereto, SoCalGas responds as follows: The daily overall physical transmission and storage system reliability operations within the System Operator are conducted by the existing Pipeline System and Planning Department under Mr. John Dagg. Other departments assist in ensuring the operational reliability of the pipeline system of which many are located in the Gas Operations Organization under Mr. Lee Stewart. The activities in support of maintaining physical flowing gas supplies as discussed by Mr. Schwecke would be conducted in concert between the Pipeline System and Planning Department and the Capacity Products Department of Customer Services - Major Markets Organization under Mr. Rick Morrow.

QUESTION 7.1:

In response to SCGC Data Request Question 6.1.1, SDG&E/SoCalGas responded:

The daily overall physical transmission and storage system reliability operations within the System Operator are conducted by the existing Pipeline System and

Planning Department under Mr. John Dagg. Other departments assist in ensuring the operational reliability of the pipeline system of which many are located in the Gas Operations Organization under Mr. Lee Stewart. The activities in support of maintaining physical flowing gas supplies as discussed by Mr. Schwecke would be conducted in concert between the Pipeline System and Planning Department and the Capacity Products Department of Customer Services - Major Markets Organization under Mr. Rick Morrow.

7.1.1 Please provide the name of each major organization unit making up the Pipeline System and Planning Department that conducts activities considered to be those of the System Operator. (A major organizational unit is one that is large enough to require a supervisor dedicated to the organizational unit.)

7.1.2 Please provide a description of the activities regularly conducted by each of the organizational units identified in the response to the previous question.

7.1.3 Please provide the name of each department in the Gas Operations Organization that conducts activities considered to be those of the System Operator.

7.1.4 For each of the departments identified in the response to the previous question, please provide the name of each major organization unit that conducts activities considered to be those of the System Operator.

7.1.5 Please provide a description of the activities regularly conducted by each of the organizational units identified in the response to the previous question.

7.1.6 Please provide the name of each major organization unit making up the Capacity Products Department that conducts activities considered to be those of the System Operator.

7.1.7 Please provide a description of the activities regularly conducted by each of the organizational units identified in the response to the previous question.

7.1.8 SDG&E/SoCalGas states: “activities in support of maintaining physical flowing gas supplies as discussed by Mr. Schwecke would be conducted in concert between the Pipeline System and Planning Department and the Capacity Products Department.”

7.1.8.1 Please specify the “activities in support of maintaining physical flowing gas supplies as discussed by Mr. Schwecke” that the statement refers to.

7.1.8.2 Please explain in detail how such activities would be conducted.

7.1.8.3 Would either department have lead responsibility to ensure completion of the tasks identified or would that responsibility fall to a different organizational unit?

7.1.8.4 For each major task or set of tasks, please name the organization unit responsible.

RESPONSE 7.1.1:

SCADA - Maintain the primary data acquisition & control (SCADA) System for the SDG&E/SoCalGas gas transmission and storage system.

Gas Control - Control and monitor day to day/hour to hour physical gas deliveries into and throughout Southern California for the SDG&E/SoCalGas gas transmission system.

Gas Scheduling - Operate the day to day systems and control that allow customers to schedule gas supply into SDG&E/SoCalGas

Gas Transmission Planning - Long term planning & design of the SDG&E/SoCalGas gas transmission system.

RESPONSE 7.1.2:
Please refer to response 7.1.1.

RESPONSE 7.1.3:

Gas Transmission & Distribution (Pipeline Integrity- Transmission, Field Operations, Technical Services, Gas Operations Services, Gas Operations – Northern Region, Gas Operations – Pacific Coast Region, and Gas Operations – South Inland Region, Storage Operations (Storage Engineering, Storage Operations – Honor Rancho, Storage Operations – Goleta, Storage Operations – Aliso Canyon, Storage Operations Play Del Rey, Technical Services)): Field operations that maintain the gas transmission system to ensure its operations availability and performance while complying with all regulatory and environmental requirements addressed in four primary areas of responsibilities; Field Operations, Field Technical Services, and Technical Training. Field Operations is responsible for the day to day operation and maintenance of gas transmission facilities and infrastructure including operating and maintaining equipment at compressor stations, pipeline receipt points, valve control stations, major customer delivery custody-transfer points, all associated monitoring, metering, and control facilities, odorization equipment, and real-time operating data telemetry communications between gas facilities and SoCalGas' Gas Control Field Operations also performs annual leak surveys of all transmission pipeline facilities, operates and maintains the cathodic protection systems, conducts surveillance of third party construction activities around the vicinity of buried pipeline facilities, and performs mark and locate services to identify the location of buried facilities. Also provides 24 hour emergency response to any operating and/or control issue related such items as earthquakes, wildfires, dig-ins, etc. in order to minimize the potential for danger

to the public and/or to minimize impact to system reliability. Field Technical Services includes the activities of design engineering, instrumentation and control, project support, and environmental services in support of the day to day operations and maintenance of the Gas Transmission system. Responsibilities include: right of way maintenance, providing on-site technical expertise to field personnel, and troubleshooting technical issues for both capital and O&M projects. Technical Training provides specialized training for the various jobs existing in Field Operations. This training includes instrumentation for measurement, control, local data acquisition, gas quality monitoring, pressure and flow, and for pipeline locate and mark, cathodic protection, welding, compressor and associated equipment maintenance, and operator qualification. Maintains the gas distribution system split into three regions to ensure its operations availability and performance while complying with all regulatory requirements including leakage surveys, leak repairs, maintenance on mains and services, application of corrosion control measures, valve and regulator station maintenance, monitoring meter accuracy, checking for odorant, and locating and marking buried pipes to avoid damage caused from digging by others. In addition, there is a variety of supporting work necessary such as maintaining pipeline maps and related gas system location information, administering and implementing city permitting and traffic control requirements, and the maintenance of engineering models of system flows and pressures. Operates four underground storage fields, in compliance with all regulatory and environmental requirements, as an integrated part of the energy infrastructure required to provide gas service through the design, operations and maintenance of the storage fields and related and provides the design, planning, and supervision of well drilling and workovers to maintain or increase storage capacity and oil production.

Gas Engineering (Measurement, Regulation and Control, Operations Technology, Planning and Project Development, Geographic Services, Engineering Design, Engineering Analysis Center, Pipeline Integrity, and Project and Construction Management) - Engineering and technical services that are performed in support of distribution, transmission and storage operations including Pipeline Integrity Management, Gas Measurement, Control and Pressure Regulation, Pipeline and Gas Facilities Engineering Design and Support, and Gas Infrastructure Project Management and Construction

Pipeline System Control & Planning – Please refer to Response 7.1.1

RESPONSE 7.1.4:
Please refer to response 7.1.3.

RESPONSE 7.1.5:
Please refer to response 7.1.3.

RESPONSE 7.1.6:

Pipeline Products – Negotiate and administer interconnect agreements and relationships with upstream suppliers. Manage the contractual arrangements for any receipt point services and pipeline services to customers including potential expansions. Maintain and develops the gas nominations/scheduling procedures and the EBB functionality.

Storage Products – Negotiate and administer unbundled storage agreements with customers including potential expansions.

Capacity Products Staff – Support the activities of the Pipeline and Storage Products groups.

RESPONSE 7.1.6:
Please refer to response 7.1.5.

RESPONSE 7.1.8.1:
Please refer to the direct and Supplemental testimony of Mr. Schwecke.

RESPONSE 7.1.8.2:
Please refer to the direct and Supplemental testimony of Mr. Schwecke.

RESPONSE 7.1.8.3:
Yes.

RESPONSE 7.1.8.4:
Actual detailed responsibility has not been determined.

RESPONSE 28.8:
The above descriptions of the departments within the Utility System Operator are still accurate. A few changes have occurred.

- The name of the "Pipeline System Control & Planning" organization is now "Gas System Operations".
- Gina Orozco-Mejia has replaced John Dagg as Director of that organization.
- Activities listed for Storage Products now includes the Operational Hub product sales as defined in SoCalGas G-PAL tariff.
- "Customer Services – Major Markets" name has changed to "Customer Services"

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Message

From: Egbert, Thomas [/O=ENOVA/OU=SDGE/CN=RECIPIENTS/CN=TEGBERT]
Sent: 10/28/2015 10:58:30 AM
To: Lane, Bret [/o=ENOVA/ou=SOCAL/cn=Recipients/cn=TPJBL]; Cardiff, Steven G [/o=ENOVA/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=SGCardif]; Van de Putte, Todd [/O=ENOVA/OU=SDGE/cn=Recipients/cn=TVandePu]
CC: Thompson, John C. [/o=ENOVA/ou=SOCAL/cn=Recipients/cn=TP3JCT]
Subject: Pressure Transmitter on SS5

John Thompson has arranged to install a pressure transmitter on SS5 today. It will provide real time data to the PI system. It should be operational by this afternoon.

He has three other transmitters available. Can you think of any other wells it might help us to have a transmitter? Porter 66 already has one.

Thomas Egbert

Senior UGS Engineer.

SoCal Gas Co. - Aliso Canyon

Office: 818-368-3607

[redacted]

Response to Data Request

Response to SED Data Request-72

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 72 related to hydrogeology, ground water and cathodic protection from Reply Testimony of Mr. Tim Hower and Mr. Charlie Stinson on behalf of SoCalGas.

Date:
Jun. 10, 2020

Version:
1

Project Number:
N/A

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Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	Jun. 10, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

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1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on April 10, 2020. Data Request No: SED 72 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED Data Request 72 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The questions are related to the document titled: *Chapter I, Prepared Reply Testimony of Tim Hower and Charlie Stinson of MHA Petroleum Consultants on behalf of Southern California Gas Company (U 904 G)* (file name: "1_Ch. I - MHA - Hower and Stinson (A Final).pdf").

2 Questions and Responses

2.1 Question 1

1. Please refer to page 22, which states, "Knowledge of the hydrogeology and groundwater is only relevant for the design and implementation of the surface casing."

2.1.1 Blade Responses

a. Does Blade agree with this?

No.

b. If not, why not?

The SS-25 well was completed with a single-barrier architecture, which relied on the pressure integrity of the production casing. In single-barrier wells, the failure of the production casing will necessarily result in the loss of integrity of the well, as happened in the 2015 SS-25 incident. The corrosion resulting from groundwater outside the production casing represented a threat to the integrity of the production casing. In addition, many of the Aliso Canyon wells had uncemented production casing in the vicinity of the groundwater. It is therefore essential for the operator to have a knowledge and understanding of the groundwater regime.

c. Does Blade accept as true that knowledge of hydrogeology and groundwater is irrelevant for operations and maintenance of:

a. The production casing that is at the same depth and covered by the surface casing?

No.

Since the surface casing cannot be relied on (or independently inspected) to maintain its integrity, it cannot be relied on to exclude groundwater from the outside of the production casing. Therefore, knowledge of groundwater behavior is essential for the production casing above the surface casing shoe as described in the response to Question 1 b. above.

b. The production casing that is at lower depths and not covered by the surface casing?

No.

In this case, production casing is adjacent to any groundwater and annulus fluid below the surface casing shoe, and the knowledge of the groundwater regime is essential as described in the response to Question 1 b. above. If cement is absent, then the groundwater and production casing are in direct contact.

c. Explain.

Explanations are included the previous responses to Questions 1.

2.2 Question 2

2. Please refer to the Section entitled, "Cathodic Protection is not Industry Standard and Was Not Necessary for SS-25." on pages 25 through 27.

2.2.1 Blade Responses

a. In particular, does Blade agree with SoCalGas's conclusion in this section that states, "Thus, an independent corrosion protection mechanism like cathodic protection would not have been useful in this case, contrary to the suggestions made in SED testimony."

   Yes. Blade agrees with the conclusion.

   Cathodic protection could have prevented the surface casing corrosion that provided additional pathways for the gas. However, cathodic protection could not have prevented the 7 in. external corrosion and subsequent rupture. This is discussed in Page 215 of the Blade Main report.

b. Why or why not?

   The production casing inside the surface casing from surface to 990 feet in SS-25, could not be protected with cathodic protection. The production casing is inside the surface casing in this region, consequently any cathodic currents would have been shielded by the surface casing and not reached the production casing. A cathodic protection system would have impressed a current and ensured that the surface casing that was exposed to the soil and surface formations, would have been protected while acting as a cathode. The 7 in. casing was inside the 11 3/4 in. casing and would not act as the cathode in such a system.

c. Provide reference to text as necessary to support the answer to questions 2a and 2b.

   This is discussed in Page 215 of the Blade Main report.

d. In Blade's view, could cathodic protection have helped protect the surface casing and production casing of well SS-25?

   No, only the surface casing could be protected and the corrosion mitigated using a cathodic protection system. The production casing inside the surface casing cannot be protected using a cathodic protection system.

e. Why or why not?

   See response to Question 2 b.

f. Provide reference to text as necessary to support the answer to questions 2a and 2b.

   The surface casing cathodic protection is discussed in Page 233 of the Blade Main Report.

g. Provide any additional context Blade deems necessary to support the answers provided.

   NACE International provides guidance on the application of cathodic protection for external surfaces of steel well casings [1]. The standard applies only to well casing exteriors and not to internal corrosion.

3 References

[1] NACE International, "Application of Cathodic Protection for External Surfaces of Steel Well Casings (NACE SP0186-007)," 2007.

CHAPTER 2
EXHIBITS

Response to Data Request

Response to SED Data Request-58

Prepared for:

Mr. Darryl Gruen
CPUC Legal Division

Purpose:

Blade response to the CPUC Data Request SED 58 related to Vertilog technology and the casing failure in SS-25 from Reply Testimony of Mr. Robert Carnahan on behalf of SoCalGas.

Date:
May 15, 2020

Version:
1

Project Number:
N/A

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Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	May 15, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

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1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on March 30, 2020. Data Request No: SED 58 related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC statements (from file: "I1906016 SED DR 58 Final.pdf") are included verbatim followed by the Blade answers to the questions.

The page numbers and figure numbers in the verbatim statements refer to a document titled: Chapter II, Prepared Reply Testimony of Robert A. Carnahan, P.E. on behalf of Southern California Gas Company (U 904 G). File name: "2_Ch. II - Exponent - Carnahan (A Final).pdf".

2 Statements and Responses

2.1 Statement 1

Pages 1 and 2: "[Public Advocates Office's] allegations presuppose that the Vertilog technology at that time [1988] was reliable and accurate. That is not the case."

2.1.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   The Vertilog or equivalent technology that existed in 1988 was capable of detecting and discriminating metal loss features, with only its sizing and characterization capabilities being limited compared to the current technology. That being said, it was the best technology available at the time for monitoring metal loss in casing and was sufficient to indicate the presence of corrosion issues.

   Mr. Carnahan incorrectly references a quote [page 2, line 12] found in a Pipeline & Gas Journal article (footnote #9). The original quote, which is related to pipeline inspection, is being misapplied to downhole logging. The complete quote is:

   > "Historically, the results of the first-generation MFL tools were not very satisfactory, but BG (British Gas) and then PII developed advanced electronics and analysis algorithms and software which set new standards in the industry."

   In Mr. Carnahan's testimony [at page 2, line 12, and page 8, line 13], he modifies the quote as follows:

   > "Historically, however, the results of the first generation of MFL tools were not very satisfactory.[9]"

   The original quotation notes the advances in technology but were not acknowledged by Mr. Carnahan. The statement by Goedecke, the original author, about first-generation magnetic flux leakage (MFL) tools and subsequent advances in technology was in reference to pipeline inspection tools. These first-generation MFL tools were developed from approximately 1959–1965 [1, 2, 3]. The first commercial effort to collect information using MFL tools was by AMF Tuboscope in 1965; the name of the tool was the Linalog [1, 2, 3]. By 1983, 112,000 km of pipeline had been inspected [4]. Mr. Carnahan mischaracterizes the Vertilog as a first-generation MFL tool but there were significant advances in MFL technology that began in the pipeline industry [2] prior to the Vertilog's deployment into oil and gas wells in the mid 1970's.

   Mr. Carnahan negatively portrays the Vertilog [page 2, line 8], "… as a mechanism that attempts to utilize Magnetic Flux Leakage (MFL) to detect casing metal loss[8]." The footnote #8 that Mr. Carnahan refers to was a 1977 Society of Petroleum (SPE) paper [5] written by employees of the logging company Dresser Atlas, which would later become part of Baker Hughes. The word "*attempts*" is not used in the reference. Although Mr. Carnahan describes the working principles of the Vertilog, he fails to provide the context that MFL and eddy current technology for the use of corrosion inspection were well established in oil and gas pipeline operations. The SPE paper's authors describe the Vertilog tool as follows:

It is a quantitative measurement of corrosive damage, indicating if the metal loss is internal or external, and if it is isolated or circumferential. Holes in the casing can be identified as well as parted casing. This survey in conjunction with other measurements, can be used to detect, monitor, and establish preventive techniques for corrosive problems.

Figure 1 shows the Vertilog and Digital Vertilog (DVRT) performance specifications as of 1991 (provided by Mr. Rod Foster, Well Integrity Senior Advisor, Baker Hughes). The two tools are essentially the same tool and sensor system but the DVRT has upgraded electronics for improved acquisition and computerized processing [6]. The DVRT was deployed in approximately 1991, superseding the Vertilog. As a point of reference, the DVRT was considered by Blade[i] for use in logging of the 11 3/4 in. surface casing as part of the SS-25 RCA. Considering the wall thickness of 0.317 in. (for 7 in. 23 ppf production casing in SS-25), the Vertilog and DVRT could detect defects deeper than 30% or 0.095 in. and size them +/- 15% or 0.048 in. For the Vertilog and DVRT, a 50% deep defect could be sized between 35–65%. In comparison, the High Resolution Vertilog (HRVRT) can detect defects that are deeper than 15% or 0.048 in. and size them +/- 10% or 0.032 in. For the HRVRT, a 50% deep defect could be sized between 40-60%.

Measurement Range:	30 to 90% penetration of the casing wall in single string
Absolute Accuracy:	±15% of actual pit depth in single string casing for isolated pitting, when casing information such as weight, grade, etc. is available
Repeatability:	±10% of first reading if pipe was fully magnetized on first pass
Sensitivity:	Casing defects as small as 0.375 in. (9.5 mm) in diameter with as little as 30% penetration can be detected and recorded at 100 ft/min (30.5 m/min) in single string
Radial Investigation:	Tool is designed to inspect the full casing circumference
Depth of Investigation:	100% of the wall of the inside casing

Figure 1: Performance Specifications for the Vertilog, and Digital Vertilog from 1991

Table 1 shows a listing of casing inspection logs that were downloaded from the DOGGR website [7] during the course of Blade's RCA; the logs are within 10 years of the proposed dates of the 1988 Interoffice Correspondence 2-year logging program [8]. As discussed in Blade's Main RCA report [9, p. 204], Blade's position is that SoCalGas made a recommendation to run the Vertilog in 20 wells that concerned them at the time. Blade reviewed the logs listed in the table that were run in approximately the same time frame as the 1988 Interoffice Correspondence. Although we did not perform an exhaustive study; in our opinion, the Vertilog was superior to the inspection tools of its day, specifically, the Welex Casing Inspection Log, McCullough Electronic Casing Caliper, and Schlumberger Electromagnetic Thickness Log. The recommendation to run Vertilog casing inspections in 20 wells appeared to Blade to have been based on using the best available technology at that time for the purpose of assessing the mechanical condition of casing flow wells completed in the 1940s and 1950s.

[i] In 2016–2017, the DVRT was the was only MFL tool available to inspect the 11 3/4 in. casing. Although the sensor system was developed in the mid-1970's with upgraded electronics in approximately 1991, the DVRT was still in-service and was initially Blade's primary MFL logging option. Because it was important to attain the most accurate data, Blade requested that Baker Hughes and its vendor, Microline Technology Corporation, adapt the HRVRT to 11 3/4 in. casing size. The DVRT was not used in the SS-25 RCA.

Mr. Carnahan's assertion is that the Vertilog was unreliable and inaccurate and combined with other factors, would not have prevented the SS-25 incident. His basis for finding the Vertilog unreliable and inaccurate is derived from his numerical comparison of five (5) Vertilogs from 1988–1990 to various HRVRT and USIT logs run in 2013 and 2016–2018. This is an approach that would not have been available to SoCalGas in the late 1980s or early 1990s. Certainly, logging technology of 2010s would be expected to be more accurate than that of late 1980s and early 1990s. However, this does not mean that the older logging tools did not provide useful or actionable information.

For example, in 1989, researchers evaluated four types of casing inspection tools, stating the following [10]:

> Electromagnetic casing inspection logs are commonly used in the industry to survey the condition of casing. Logs may be used to estimate the amount of pitting, degree of corrosion, wall thinning, changes in diameter, and other casing features. Occasionally, casing inspection logs are used to investigate a casing failure in a well. Interpretations of casing inspection logs may be used to determine the type of remedial work on a well where a casing failure has occurred, or they may be an important factor in a commercial casing failure claim.

There are key concepts in this paper related to casing inspection tools available in 1989. The first was that casing inspection tools were commonly used for detecting pitting, degree of corrosion, and wall thinning. The second was the authors describe MFL technology, specifically mentioning the Vertilog, as capable of being able to distinguish between split and parted casing.

Two of the wells in Table 1 had underground blowouts, namely F-3 and FF-34A, which were logged in 1986 and 1991 respectively. These dates bookend the Vertilog logging campaign outlined in the 1988 Interoffice Correspondence. Note that the Schlumberger Ultrasonic Imager (USIT) was run in P-42B in 1993, which was not that long after the September 10, 1990 FF-34A casing failure and when the Vertilog logging campaign was discontinued.

Table 1: Aliso Canyon Casing Inspection Logs within 10 years of 1988–1990

Well	Date	Vendor	Log Name
FF-35B	August 31, 1978	McCullough	Electronic Casing Caliper
SS-1	February 27, 1980	McCullough	Electronic Casing Caliper
MA-1A	February 28, 1985	McCullough	Electronic Casing Caliper
F-3 [b]	January 31, 1986	Welex	Casing Inspection Log
F-4 [a c]	September 6, 1988	Western Atlas	Vertilog
P-37 [a]	October 11, 1988	Western Atlas	Vertilog
P-46 [a, c]	October 19, 1988	Western Atlas	Vertilog
SS-9 [a, c]	December 16, 1988	Western Atlas	Vertilog
SS-8 [a, c]	January 17, 1989	Western Atlas	Vertilog
P-32C	July 26, 1989	Western Atlas	Vertilog
P-34 [a, d]	November 2, 1989	Western Atlas	Vertilog
FF-35B [c, d]	November 11, 1989	Western Atlas	Vertilog
MA-1A	December 27, 1989	Western Atlas	Vertilog
F-2 [a, d]	January 11, 1990	Western Atlas	Vertilog

Well	Date	Vendor	Log Name
FF-35C	September 18, 1990	Western Atlas	Vertilog
SS-14	March 5, 1991	Halliburton	Casing Inspection Log
FF-34A [b]	May 11, 1991	Schlumberger	Electromagnetic Thickness Log
P-42B	January 11, 1993	Schlumberger	Ultrasonic Imaging Tool
P-68B	May 27, 1993	Halliburton	Casing Inspection Log
SS-14	May 26, 1998	Halliburton	Casing Inspection Log
SF-2	November 19, 1999	Schlumberger	Ultrasonic Imaging Tool

[a] – Wells listed in the 1988 Memo (F-4, P-37, P-46, SS-9, SS-8, P-34, F-2)
[b] – Wells that had blowouts (F-3, FF-34A)
[c] – Wells reviewed by Mr. Carnahan (F-4, P-46, SS-9, SS-8, FF-35B)
[d] – Logs not available on the DOGGR website (P-34, FF-35B, F-2)

Mr. Carnahan's spreadsheet analysis neglects important findings that are visible graphically on the log. There is considerable information that can be derived from looking at the log image. Different logs employ different technology; the characterization and sizing of features may appear different. Most logging companies have some version of the cement bond log with variable density (CBL – VDL) for the determination of zonal isolation (i.e., to evaluate if the cement is an effective barrier). Although these logs have been utilized for over 50 years, the best way to interpret the presence of cement and the bond to pipe and formation is to *look* at the log. There are wavy, chevron, zigzag, and other patterns that have meaning. This is the same for the Vertilog and other casing inspection logs. There is data in the patterns.

Blade performed an analysis of F-4's 1988 Vertilog as part of the RCA [11] comparing it to the 2016 Ultrasonic Imager (USIT) log. Figure 2 shows these two logs with the Vertilog on the left and USIT on the right. To aid in interpretation from joint to joint, the logs have been adjusted so that the casing connections of each log are aligned. External metal loss is denoted by blue text at A, B, and C on the Vertilog's Flux Leak track, and by the same letter on the USIT's wall thickness track. At A-A, external metal loss is found just above a connection. At B-B, external metal loss is found approximately midway in the joint. At C-C, there is external metal loss below a connection. The point here is the two logs found the same defects.

There was good agreement between the logs at most depths. However, in some cases, the logs did not agree. It should not be assumed that the 2016 USIT log was the more accurate one. In Blade's experience, MFL tools are better at detecting pitting corrosion. In general, it's a flawed concept to compare one log tool to another and automatically claim one is more accurate than the other. Log data has to be compared to truth data (direct measurements of defects) to assess log performance. In today's era, repeatability and reproducibility of pipeline inspection tools are verified independently in pull-through tests (e.g., Pipeline Research Council International Integrity and Inspection projects). Even today, very little data has been published in testing downhole logging tools in controlled environments. An independent comparison of casing inspection logging tools spanning decades does not exist, however, the Vertilog and other casing inspection tools could have been used as an indicator of an issue.

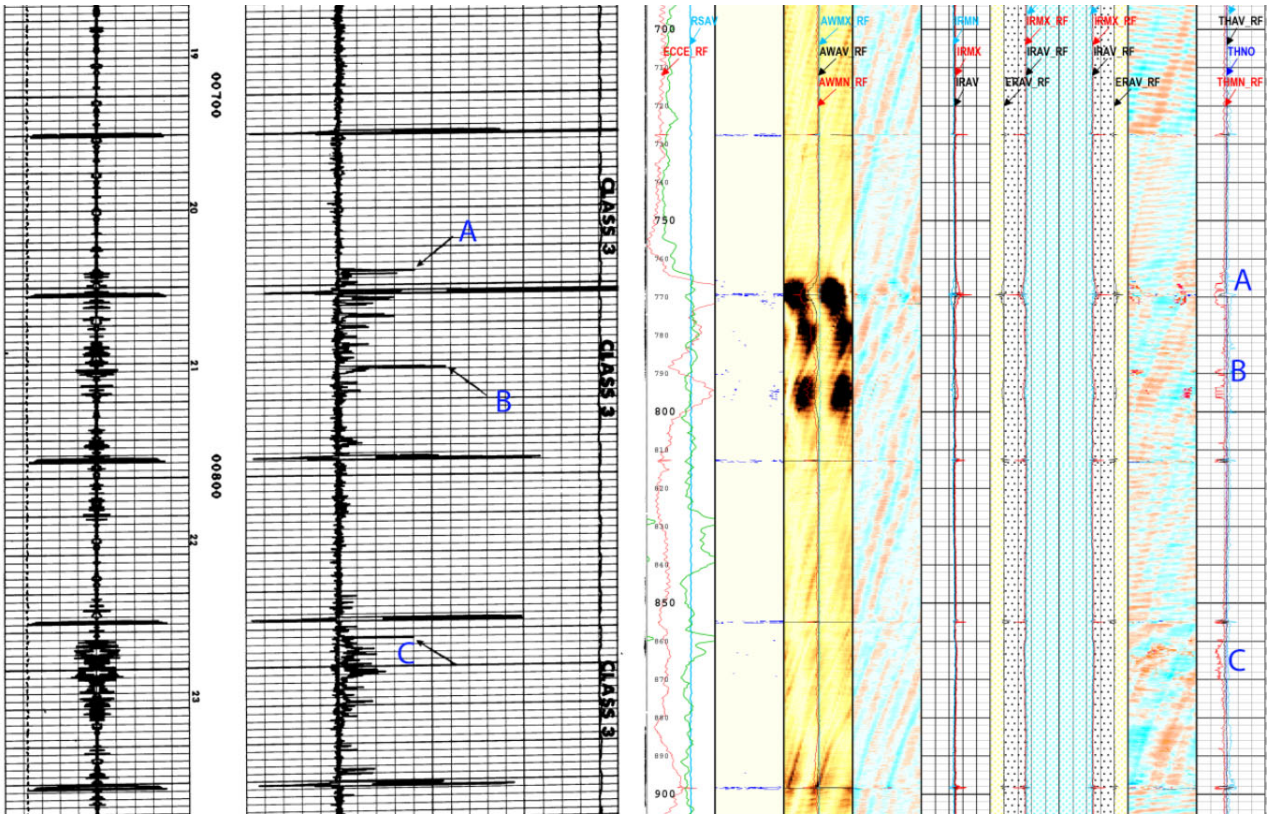

Figure 2: F-4 1988 Vertilog (Left) and 2016 USIT (Right) Comparison

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   SoCalGas had a two-year plan in 1988 to determine the mechanical condition of the casing in 20 wells originally completed in the 1940s and 1950s. Blade reviewed the records of all 20 wells to evaluate subsequent casing inspections and the casing problems that occurred in the following years. A number of casing problems were identified. SoCalGas made a recommendation to run casing inspection logs in 20 wells that concerned them at the time, and the opportunity to inspect the casing in SS-25 was missed. There is no way to know what an inspection of the SS-25 casing would have shown in 1988, but it is possible that corrosion was present and detectable, and steps could have been taken to avoid the leak in 2015 [9, pp. 2, 160, 173–181, 204-205] [12].

   The fact is that SS-25 and other 1988 Interoffice Correspondence wells did not get inspected according to plan.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Even if Blade accepted Mr. Carnahan's statement as true, it would not change any of the conclusions Blade reached in its Root Cause Analysis.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not Applicable. No conclusion changes are needed.

2.2 Statement 2

Pages 3 and 4: "While useful to a certain extent, the Vertilog technology circa 1988 suffered from certain substantial deficiencies."

2.2.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   The Vertilog circa 1988 was useful because it could be used to assess casing integrity in terms of the location and severity of metal loss.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   See the response to Statement 1, Question 3.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Mr. Carnahan's statement does not change the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.3 Statement 3

Page 4: "For example, the Vertilog technology did not provide a method for differentiating isolated pitting from general corrosion."

2.3.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   The Vertilog was capable of differentiating general corrosion from isolated pitting. The methodology is discussed in a previously referenced SPE paper [5]. Figure 3 shows the F-4 Vertilog Defect Report. Isolated pitting is denoted by IP and general corrosion is denoted by GC.

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Western Atlas International

CUSTOMER SOUTHERN CALIFORNIA GAS COMPANY WORK ORDER NO. 124201 PAGE ____ OF ____

LEASE/WELL NO. FREW No. 4 CUSTOMER ORDER NO. DATE 9-6-88

FIELD ALISO CANYON COUNTY LOS ANGELES STATE CALIFORNIA

CASING O.D. 7" WEIGHT(S) 23#, 26# NOMINAL WALL THICKNESS GRADE N-80, J-55

TOTAL FOOTAGE INSPECTED 8180' FROM SURFACE TO 8180' DEPTH

SUBSURFACE CASING DEFECT REPORT

LENGTH NO.	TYPE DEFECT	PENETRATION	LENGTH NO.	TYPE DEFECT	PENETRATION
INSIDE 13-3/8" CASING					
7	OD IP	21 - 40	111	OD IP	41 - 60
13	OD IP	21 - 40	113	OD IP	41 - 60
20	OD IP	41 - 60	114	OD IP	41 - 60
21	OD IP	41 - 60			
OUTSIDE 13-3/8" CASING					
23	OD IP	41 - 60			
25	OD IP	21 - 40			
26	OD IP	21 - 40			
27	OD IP	41 - 60			
28	OD IP	41 - 60			
29	OD GC	21 - 40			
30	OD IP	21 - 40			
31	OD IP	21 - 40			
32	OD IP	41 - 60			
47	OD IP	21 - 40			
49	OD IP	21 - 40			
56	OD IP	21 - 40			
61	OD IP	21 - 40			
72	OD IP	61 - 80			
83	OD IP	21 - 40			
106	OD IP	41 - 60			
107	OD IP	41 - 60			
108	OD IP	41 - 60			
109	OD IP	61 - 80			

ABBREVIATIONS:
O.D. – OUTSIDE DIAMETER
I.D. – INSIDE DIAMETER
I.S. – INSIDE SURFACE PIPE
T.L. – THROUGHOUT LENGTH
I.P. – ISOLATED PITTING
C.C. – CIRCUMFERENTIAL CORROSION
G.C.-GENERAL CORROSION

Figure 3: F-4 Vertilog Defect Summary Report, GC – General Corrosion and IP Isolated Pitting

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   See the response to Statement 1, Question 3.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.4 Statement 4

Page 5: "Another problem with Vertilog is that there are multiple permutations associated with the analysis of metal loss at any given depth, resulting in inherent uncertainty when interpreting the results."

2.4.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Casing inspection logs of all types can be processed and analyzed using different criteria and assumptions. There is inherent uncertainty in interpreting all casing inspection logs. The process is not automated with only one set of answers. Log analysts use their best judgement to provide most probable interpretations. See below for standard verbiage for casing inspection logs from Baker Hughes:

   FF-32A, HR Vertilog, 2016

   > In making interpretations of logs our employees will give customer the benefit of their best judgment. But since all interpretations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages, or expenses whatsoever incurred or sustained by the customer resulting from any interpretation made by any of our employees.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   See the response to Statement 1, Question 3.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.5 Statement 5

Page 7: "Additional flaws of Vertilog were its inability to distinguish between defects and hardware (such as centralizers and scratchers) and its difficulty interpreting corrosion located near the surface casing shoe."

2.5.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Blade would agree that the tool will have difficulty interpreting corrosion above, but not below, the shoe.

   Blade agrees with "…flaws of Vertilog were its inability to distinguish between defects and hardware (such as centralizers and scratchers)...". However, there is a key omission in Mr. Carnahan's testimony regarding the method in which the tool designers had envisioned solving this issue. References [5, 6] describe the use of accurate casing records to address the interpretation of centralizers and scratchers. The quote from [6, p. 1] below explains this issue clearly:

   > In the earlier Vertilog survey, casing hardware (e.g., scratchers and centralizers) caused responses which are similar to corrosive defect responses. Often casing records must be relied upon for identifying the log responses due to scratchers and centralizers, to insure [sic] that these responses

are not misinterpreted as casing defects. If the records are accurate, casing hardware responses are not mistakenly interpreted as defects. If the records are inaccurate, casing hardware responses can be interpreted as corrosive defects.

During the course of Blade's Analysis of Aliso Canyon Wells with Casing Failures study, numerous well records were analyzed. In our opinion, many of the well records that SoCalGas inherited from previous operators did not include an accurate location for centralizers and scratchers. Blade also reviewed hundreds of casing inspection logs from Aliso Canyon. It was common for the production casing string (e.g., 7 in., or 8 5/8 in. casings) to include a few joints of casing that were a different weight than reported. In other words, in the 200 or so joints that comprise the production casing string, it was likely that an occasional joint of thicker or thinner walled casing was run in the wrong position. This may not have any bearing on the casing string's pressure capacity. Inaccurate records on centralizers, scratchers, and casing weight and dimensions could result in Vertilog defect misinterpretation.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   In Blade's opinion, the Vertilog may overstate metal loss in multi-string casing configurations where an outer casing exists over part of the casing being inspected; this is discussed in the *Aliso Canyon Shallow Corrosion Analysis* supplementary report [11, p. 34].

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.6 Statement 6

Page 20: "Pressure testing is intended to detect existing casing leaks, not wall loss."

2.6.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

   Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No conclusion changes are needed.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

Not applicable. No conclusion changes are needed.

2.7 Statement 7

Pages 24-25, which states:

The Blade main report and various supplementary reports assert that the SS-25 7-in. casing's vertical rupture and circumferential parting were two separate events, with the circumferential parting occurring some period of time after the initial vertical rupture, but while the well was still on injection. To the contrary, it is evident the SS-25 7-in. casing vertical rupture and circumferential parting occurred as a single event, as illustrated in Figure 12 and Figure 13, and for the reasons described below:

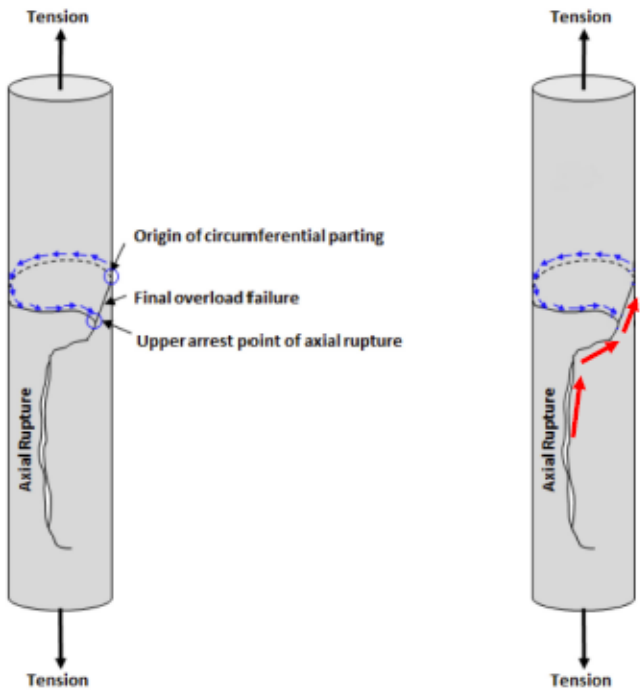


Figure 12. Left: Figure 70 from page 73 of Blade main report. Right: Corrected Figure 70 with red arrows added, which in addition to existing blue arrows, show actual crack propagation direction. The upper vertical fracture did not arrest abruptly at the location indicated by Blade. The circumferential fracture simply ran into the existing (mostly) vertical fracture and stopped (location of lowest blue arrow).

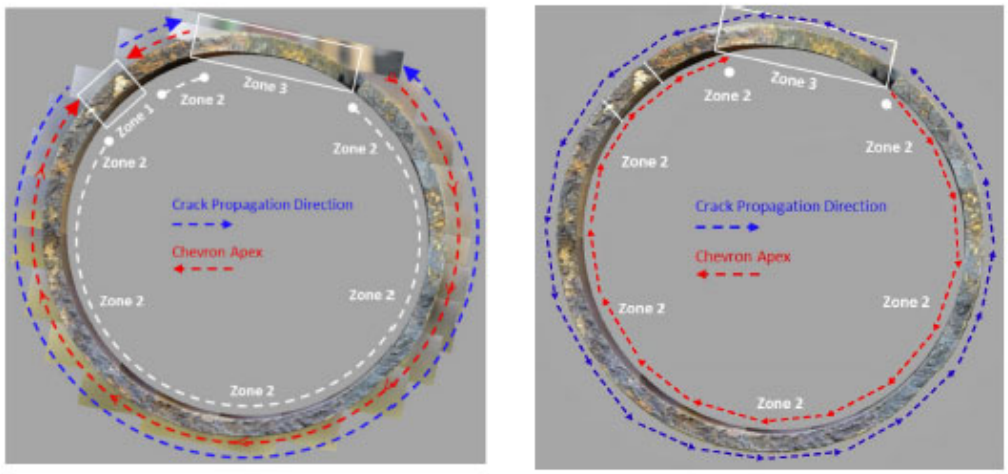


Figure 13. Left: Figure 69 from Blade main report. Right: Corrected Figure 69 showing actual crack growth direction.

2.7.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Mr. Carnahan's statement does not take into consideration all of the facts provided in Blade's Main and supplementary reports. Central to the argument are two facts. First, there are arrest turning points on both ends of the axial rupture. Second, there is no continuity of chevron marks from the axial rupture to the circumferential parting. This is further discussed in detail below.

   On page 54 in Section 2.4 of Blade's Main Report [9], it clearly states: "Visual and stereoscopic examination of the circumferential parting showed that the failure was not a continuation of the axial rupture, but rather re-initiated near the corner on one side of the parted casing. The origin site was determined based on chevron marks identified on the fracture surface. Figure 47 is a (a) laser scan and (b) image which identifies the upper arrest point, circumferential parting initiation site, and the final overload failure. Figure 48 is stitched stereo images showing the chevron marks and propagation direction of the circumferential parting. These observations indicate that the axial rupture and circumferential parting were two separate events despite their close proximity, and that they are most likely related to each other. This is discussed in more detail later within this section." Figures 47 and 48 are extracted from the Blade Main Report.

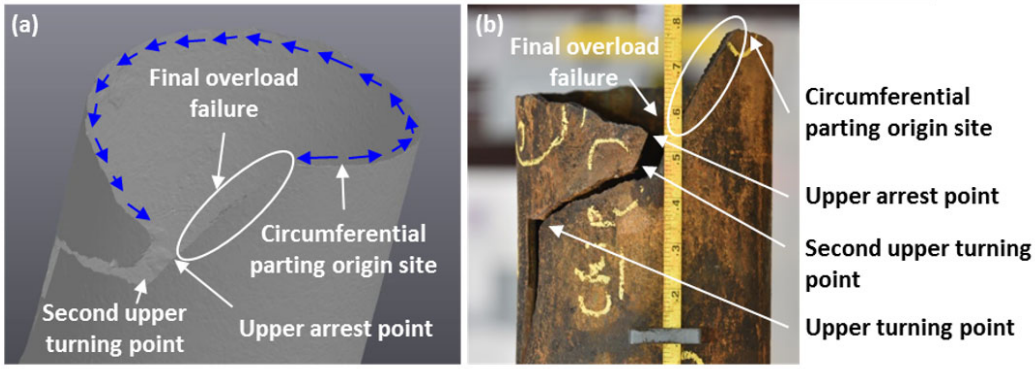


Figure 47: (a) Laser Scan and (b) Photo Indicating Circumferential Parting Initiation Site and Final Failure

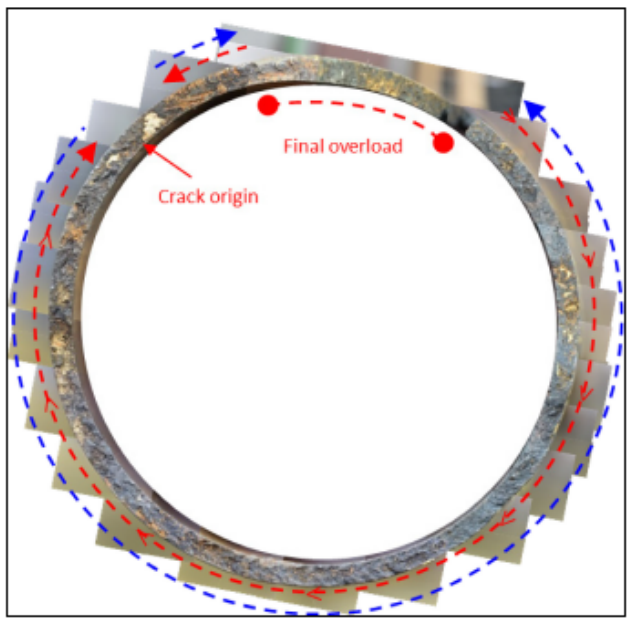


Figure 48: Stitched Images of the Lower Circumferential Parting Fracture Surface

Additional evidence is provided by Blade (Figure 67 on page 71 of Blade's Main report) illustrates the three zones of the circumferential parting. Figure 67 (a) is a stereo image showing the three zones, origin, and the direction of the crack propagation. Figure 67 (b) is a 3D schematic showing the overall circumferential parting steps. Figure 67 (c) is a close-up of the Zone 3 fracture surface, which does not exhibit any chevron marks, thus there is no continuity of the axial fracture.

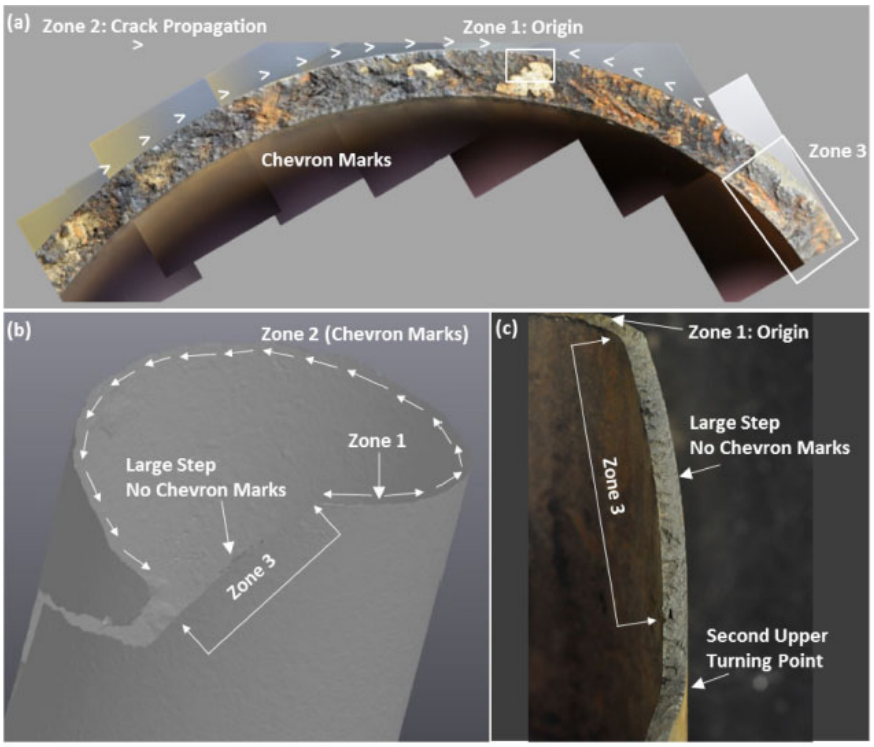


Figure 67: (a) Stereo Image (b) 3D Schematic of Zones (c) Macro Image of Three Zones

Based on the factual evidence shown above (pages 72 and 73 in Blade's Main report), Blade concluded "Additional detailed visual and stereoscopic examination showed that the circumferential parting was not an extension of the axial rupture. Chevron marks produced by the circumferential parting did not follow the chevron marks produced by the axial rupture. The initiation site and chevron marks produced by the circumferential parting were located approximately 3.7 in. (94 mm) from the upper arrest point of the axial rupture. Figure 70 (i.e., Figure 12 above quoted by Mr. Carnahan's testimony) is a schematic of the crack path for the axial rupture and circumferential parting. The schematic shows how the circumferential parting initiated above the arrest point of the axial rupture. The crack propagated circumferentially until it reached the axial rupture arrest point. The final ligament failed due to the axial load generated by the weight and tension of the 7 in. casing string. **The axial rupture and circumferential parting are thought to be two separate events because there was no evidence that the chevron marks from the axial rupture continued into the circumferential parting.** The close proximity of the two failures suggests that they are related despite being two separate events." (emphasis added)

Blade has followed the well established guidelines described in the literature, for example, *Fracture Appearance and Mechanisms of Deformation and Fracture*, Metals Handbook Vol. 11, 2011, pages 559-561 [13], and determined that the SS-25 failure consisted of two separate events because of the absence of evidence showing a single pathway of chevron marks connecting the axial fracture with the circumferential parting. There is no continuity of chevron marks from axial to circumferential. There is an arrest point on the axial fracture as shown by the metallurgical evidence. These facts have to be rationalized in any interpretation of the failure sequence.

Blade disagrees with the interpretation in Mr. Carnahan's testimony.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

No additional context is required. The factual evidence provided in Blade's reports support the fracture sequence described in the report.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's primary assertion that the vertical rupture and the circumferential part were one event, then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.8 Statement 8

The SS-25 fracture surface exhibits clear chevron marks at a number of locations. Chevron marks denote the direction of propagation of cracks in steels – the apex of the chevron points toward the fracture origin (Figure 14). Chevron marks on the SS-25 fracture surface show clearly that the circumferential fracture is an extension of the axial fracture (Figure 15). This interpretation is consistent with remarkably similar chevron marks shown in a textbook on failure analysis (Figure 16).

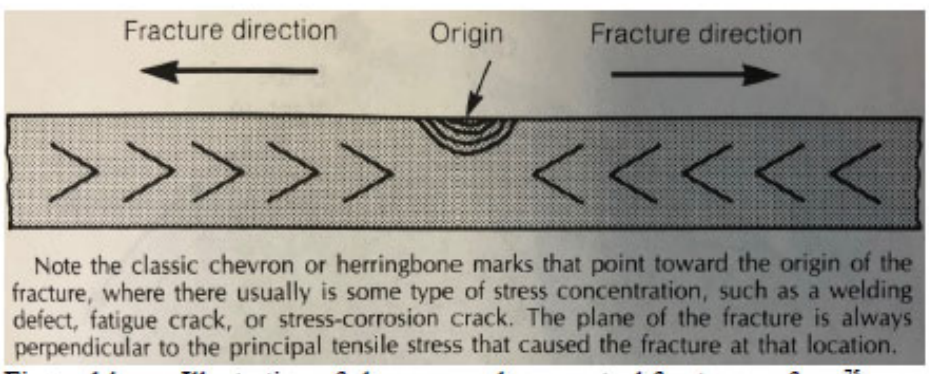


Figure 14. Illustration of chevron marks on a steel fracture surface.[75]

Figure 15. Figure 68 from page 72 of Blade main report. Red rectangle encloses backward chevron marks drawn by Blade. Red chevron marks inserted above are consistent with chevron marks present on the fracture surface. Blade misidentifies the chevron marks as flowing towards the origin. Based on both my physical inspection on February 27-28, 2020, and my analysis of this image, the chevron marks travel to the right, as indicated by the red arrows at the bottom of the figure.

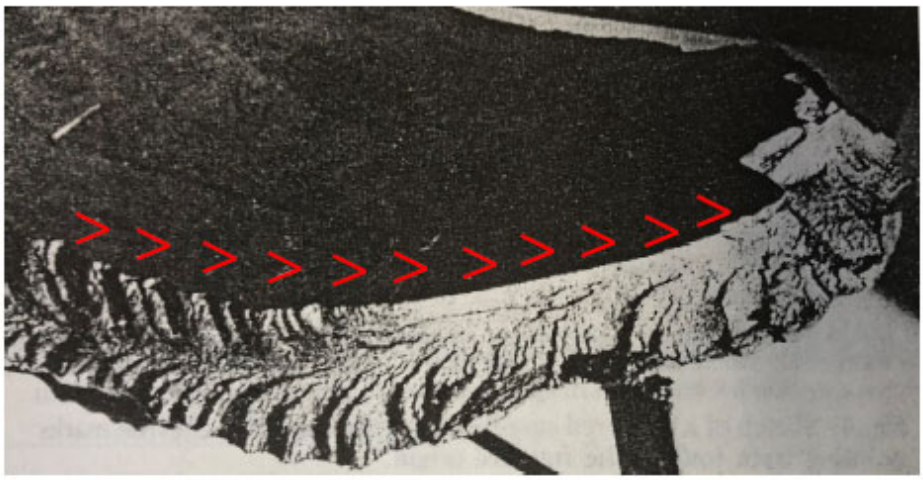


Figure 16. Fragment of a thick-walled fractured drum. The fracture, which started at the right, ran rapidly to the left, resulting in a well-defined chevron pattern.[76]

2.8.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Blade disagrees with Mr. Carnahan's testimony because he does not show with metallurgical evidence, the extension of the axial fracture to the circumferential parting. Therefore, there is no metallurgical evidence to support the interpretation that axial rupture and circumferential parting are one event.

   Mr. Carnahan's testimony correctly states that "the SS-25 fracture surface exhibits clear chevron marks at a number of locations. Chevron marks denote the direction of propagation of cracks in steels—the apex of the chevron points toward the fracture origin (Figure 14 provided by Mr. Carnahan in his testimony)", however, he incorrectly states that, "chevron marks on the SS-25

fracture surface show clearly that the circumferential fracture is an extension of the axial fracture (Figure 15)". Mr. Carnahan did not show where in the figure that he clearly saw the chevron marks extending from the axial fracture to the circumferential fracture. In contrast, as previously indicated in Blade's response to Mr. Carnahan's Statement 7, Blade provided macro- and micro-fractographic evidence in the Main and Supplementary Reports, see Figure 67 on page 71 of the Main Report, which shows no chevron marks present after the axial fracture was arrested and no chevron marks on the final overload rupture.

The figure below (Figure 68 (a), page 72 of Blade Main Report) shows no chevron marks on the final overload rupture. For clarity, we have annotated the upper corner on the right-hand side of the figure with the green arrow) indicating no chevron marks on the final overload failure of Zone 3 of the circumferential parting. On the circumferential fracture surface there is no extension of the axial fracture chevron marks.

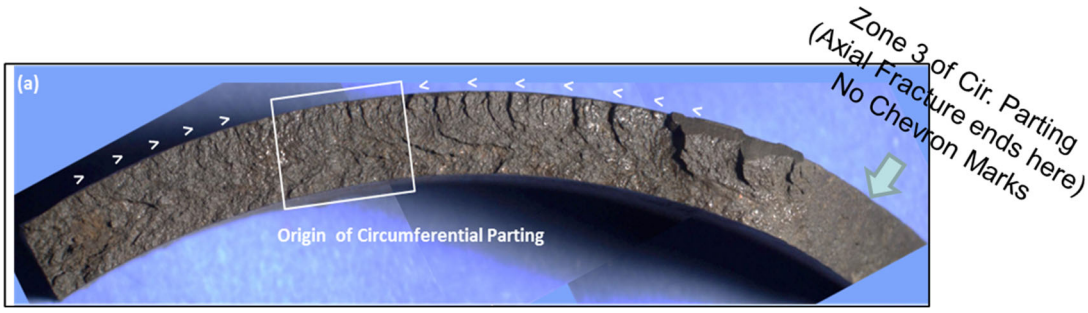


Figure 68 (a), Page 72 Blade Main Report

In the caption of Figure 15 below, Mr. Carnahan states "Blade misidentified the chevron marks as flowing towards the origin. Based on both my physical inspection on February 27-28, 2020, and my analysis of the image, the chevron marks travel to the right, as indicated by the red arrows at the bottom of the figure."

Figure 15. Figure 68 from page 72 of Blade main report. Red rectangle encloses backward chevron marks drawn by Blade. Red chevron marks inserted above are consistent with chevron marks present on the fracture surface. Blade misidentifies the chevron marks as flowing towards the origin. Based on both my physical inspection on February 27-28, 2020, and my analysis of this image, the chevron marks travel to the right, as indicated by the red arrows at the bottom of the figure.

Blade disagrees with the statement because the visual and stereomicroscopic examinations performed by Blade showed that the apexes of the chevron marks are in the opposite directions around the origin. This is further clarified in Figure 68(a), page 72 of the Blade Main Report below that shows the chevron marks point back towards the origin from either side of the origin. For

clarity, white dashed lines have been added to the figure to outline the chevron marks that point back towards the origin from either side of the origin. This is inconsistent with Figure 16 of Mr. Carnahan's testimony.

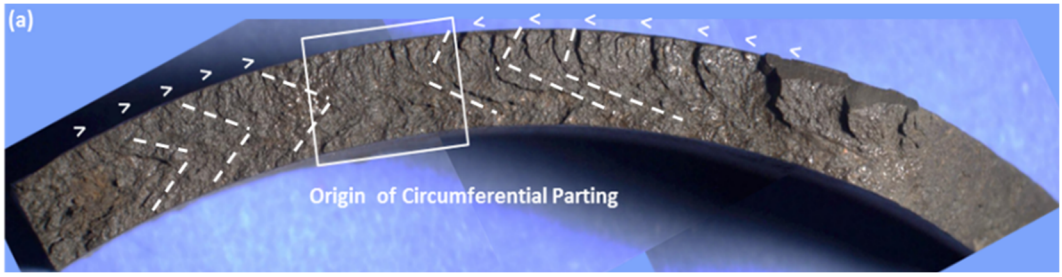


Figure 68 (a), Page 72 Blade Main Report

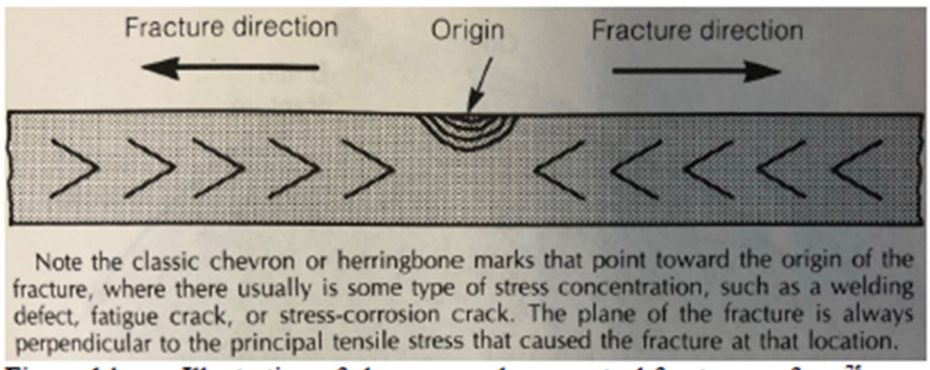


Figure 14. Illustration of chevron marks on a steel fracture surface.[75]

Figure 16. Fragment of a thick-walled fractured drum. The fracture, which started at the right, ran rapidly to the left, resulting in a well-defined chevron pattern.[76]

In summary, the explanation provided in the Blade Main and Supplementary reports demonstrates the existence of two events in the failure process:

- The chevron marks are not continuous and do not extend from the axial rupture to the circumferential parting. See Figure 67(a) on page 71 of the Blade Main Report.

- There is a clear indication of arrest at the end of the axial fracture path as shown in the Blade supplementary report *SS-25 Casing Failure Analysis Report* [14]on page 121, Figure 142.
- There are chevron markings in opposite directions on the circumferential fracture surface which point towards the origin, see Figures 68 and 69 on page 72 of the Main Report and Figure 160 on page 134 and Figures 161 and 162 on page 135 of the supplementary report.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's primary assertion that the vertical rupture and the circumferential part were one event, then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.9 Statement 9

Blade's contention that a separate fracture origin exists on the circumferential portion of the fracture is incorrect (Figure 17). Rather than a fracture origin, this area is merely a continuation of the circumferential portion of the fracture. Fracture surface markings within the hypothesized origin are the same as or similar to those outside of the origin.

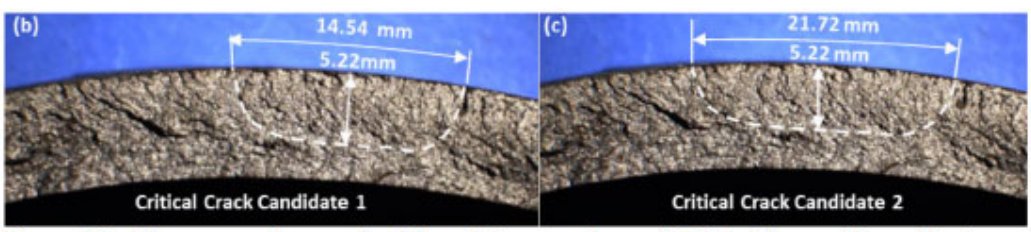


Figure 17. There are no features in either of the areas shown in Blade Figures 68b or 68c that suggest the existence of a fracture origin.

2.9.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

An examination of the chevron marks in Figure 17 (i.e., Figure 68 in Blade's Main Report, page 72), showed that the features inside the origin were different from chevron marks outside the origin. The examination identified an area (the origin) that was absent of chevron marks but had chevron marks on either side pointing towards it. For clarity, white dashed lines have been added to outline the chevron marks that point back towards to the origin from either side of the origin. This observation is consistent with the illustration, Figure 14, provided by Mr. Carnahan.

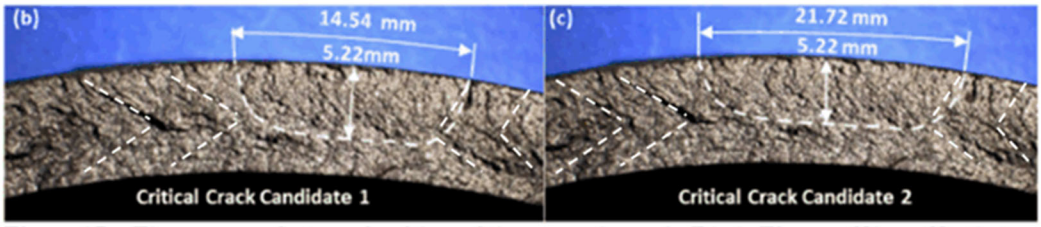


Figure 17. There are no features in either of the areas shown in Blade Figures 68b or 68c that suggest the existence of a fracture origin.

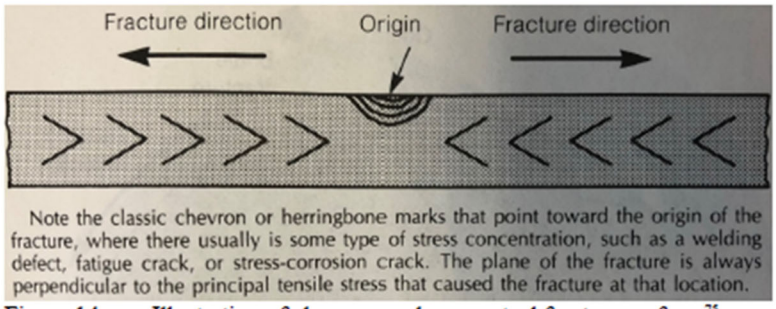


Figure 14. Illustration of chevron marks on a steel fracture surface.[75]

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's primary assertion that the vertical rupture and the circumferential part were one event, then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.10 Statement 10

The Blade report says nothing about how this alleged fracture origin came into existence. If the origin was created during the casing manufacturing process or by a sub-critical crack growth mechanism such as fatigue or stress-corrosion, the surface of the origin would appear distinctly different.

2.10.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Blade disagrees with Mr. Carnahan's testimony because there is a SEM micrograph in the Blade supplementary report that clearly identifies the circumferential fracture origin. This has not been referenced or discussed in Mr. Carnahan's testimony.

   Blade showed that "the SEM examination of Zone 1 identified a pre-existing crack-like flaw on the OD side of the origin", see Figures 168 and 169 on pages 140 – 141 of the *SS-25 Casing Failure Analysis* supplementary report. The crack-like flaw was shallow, with a measured maximum depth of 196 µm. This was a pre-existing flaw and was associated with the origin of the circumferential fracture. Figure 170 in the same supplementary report shows an EDS analysis indicating that the surface of the flaw was severely oxidized by a scale that could not be removed during cleaning. The adjacent fracture surface was easily cleaned and clearly showed cleavage facets. This observation suggests that the flaw existed prior to the circumferential parting. This OD surface flaw may have promoted brittle cracking to form the origin of the circumferential parting, even though the flaw was shallow. The presence of a pre-existing OD oxidized flaw clearly exhibits that the circumferential parting had a separate initiation site. This information was not considered in Mr. Carnahan's testimony.

   A complete validation of the size of the origin (i.e., the critical crack size for circumferential parting) is given in Section 2.4.4 of Blade's Main Report (page 74) and in Section 4.3 of the *SS-25 Casing Failure Analysis* supplementary report (page 164). Further discussion on this topic in detail is given in the next section, i.e., Blade's response to Mr. Carnahan testimony Statement 11, Section 2.11 in this document.

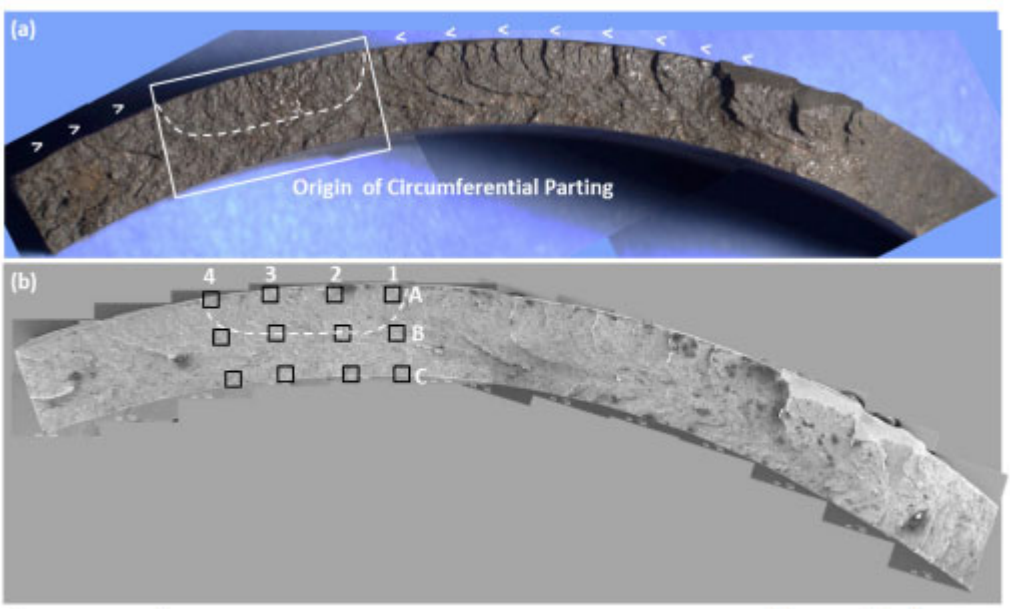


Figure 168: Specimen C023A1A1A (a) Stereo and (b) SEM Images of Zone 1 (Origin) Investigation Areas

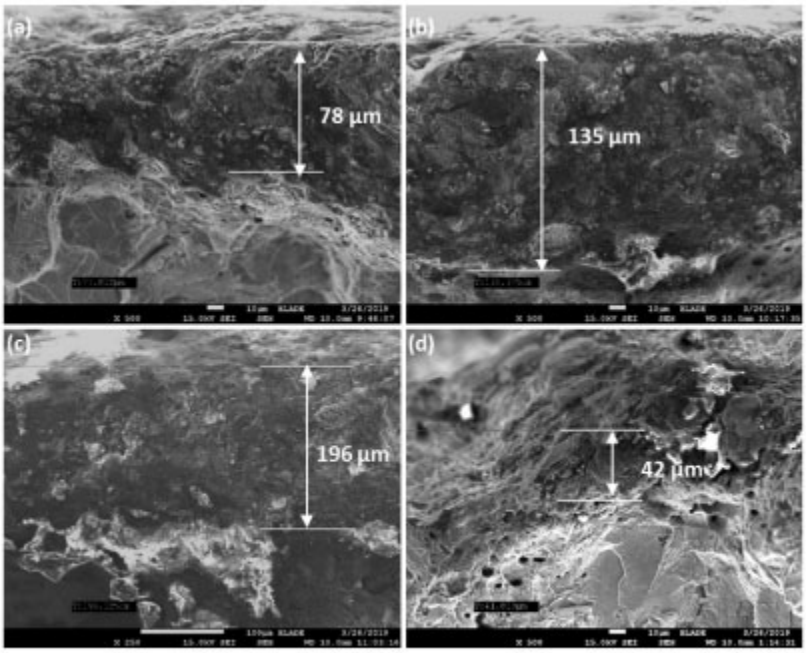
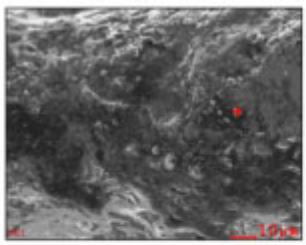
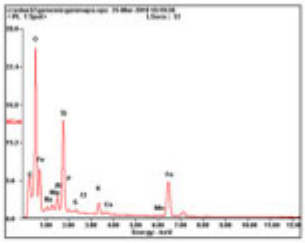


Figure 169: SEM Images of Pre-existing Flaws at (a) 1A, (b) 2A, and (d) 4A Taken at 500×, and (c) 3A Taken at 250×





Element	Wt%	At%
CK	09.93	22.27
OK	27.98	47.08
NaK	00.30	00.35
SiK	00.48	00.46
SK	00.24	00.20
ClK	00.51	00.39
CaK	00.24	00.16
MnK	00.71	00.35
FeK	59.62	28.74
Matrix	Correction	ZAF

(a) SEM image. The red spot is where the EDS analysis was performed

(b) EDS Spectra. A high oxygen peak is noticeable

(c) Concentration of the scale showed iron oxide

Figure 170: EDS Results for Pre-Existing Flaws

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. Blade did identify an origin for the circumferential fracture, the evidence was provided by the stereo microscopic and SEM micrographs in the Blade supplementary report. If, however, Mr. Carnahan's testimony is considered to be true, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

Not applicable, no conclusions change.

2.11 Statement 11

Blade's inability to determine the size of alleged fracture origin (they report it as 5.22 mm deep and either 14.54 mm long or 21.72 mm long[72]) is consistent with the absence of features identifying it as an origin.

2.11.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Blade did identify two semi elliptical areas as possible critical crack sizes (origin) for the circumferential parting based on thorough examination with the stereo microscope and SEM; it was 5.22 mm deep and either 14.54 mm long or 21.72 mm long. The exact length is later established in the Blade report as 21.72 mm long.

   Blade identified the fracture origin of the circumferential parting based on the observed apexes of the chevron marks pointing at the origin, along with the presence of a pre-existing OD oxidized flaw. This was also discussed in Statements 9 and 10. Blade identified two semi elliptical areas as possible critical crack sizes (origin) for the circumferential parting based on thorough examination with the stereo microscope and SEM, one is 14.54 mm long x 5.22 mm deep and the other one 21.72 mm long with the same depth, see pages 71 and 72 of Blade's Main Report and Section 3.3.1 on page 134 of Blade's supplementary report *SS-25 Casing Failure Analysis* for details. Figure 17 provided by Mr. Carnahan in Statement 9 (i.e., Figure 68 in Blade's Main Report, page 72), with added dashed lines to outline the chevron marks), showed that the features inside the origin were different from chevron marks outside the origin. The examination identified an area (the origin) that was absent of chevron marks but had chevron marks on either side pointing at it.

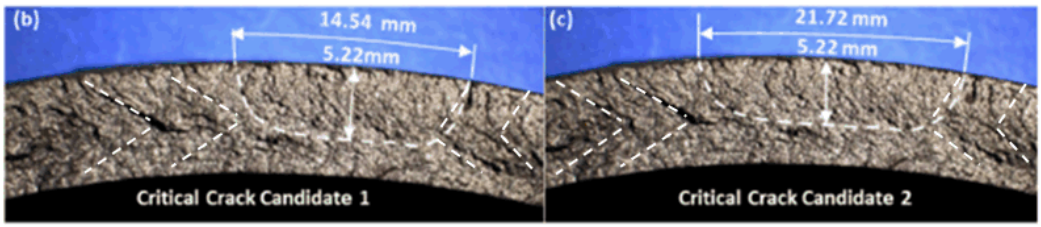


Figure 17. There are no features in either of the areas shown in Blade Figures 68b or 68c that suggest the existence of a fracture origin.

The location of the origin is often well identified, and uncertainty in origin sizing is not uncommon. Therefore, it is common practice that the identified candidate flaw sizes are often validated or refined using fracture mechanics methods or FEA and other methodologies. Such an approach was undertaken for the circumferential flaw.

The validation of the two possible sizes of the origin (critical crack size) for circumferential parting was performed using the following approach:

- Fracture mechanics calculation of the applied stress intensity factor for each of the possible origin size, i.e., the driving force for circumferential parting using the flaw size and axial load

as per API 579 [15] and BS 7910 [16] procedures (see Section 4.3.1 of the *SS-25 Casing Failure Analysis* supplementary report, pages 164-165 for details)

- Fracture toughness from CVN was estimated as a function of temperature using API 579 and BS7910 recommended procedures (see Section 4.3.3 of the supplementary report, pages 167-168 for details)
- An independent estimate of the casing temperature at time of failure using a thermo hydraulic model (see Section 4.3.4 of the supplementary report, page 169 for details)

By comparing the validation methods above, one of the two possible size of the origin, that is, the one having the size of 21.72mm long x 5.22 mm deep was validated as the most likely critical crack size for the circumferential parting. This is discussed in detail in Blade Main and supplementary reports.

For this failure, Blade integrated two different approaches to refine the origin. The origin was first established using microscopy and visual observations. Next, Blade used fracture mechanics and temperature, followed by toughness (established through laboratory testing) to finalize the origin size. Using one methodology such as, macro- and micro- fractographic methods, to interpret failure is inadequate for failure analysis; such interpretation has to be consistent with quantitative fracture mechanics estimates.

Consequently, Blade has unequivocally established that the circumferential parting initiated from the origin identified by using microscopy, visual observations and fracture mechanics.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's assertion that "Blade's inability to determine the size of alleged fracture origin (they report it as 5.22 mm deep and either 14.54 mm long or 21.72 mm long) is consistent with the absence of features identifying it as an origin", then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.12 Statement 12

Blade's scanning electron microscope (SEM) photos of the hypothesized origin show predominantly cleavage features.[73] Blade reported that no noticeable changes in fracture mode were observed outside of the origin[74] and their SEM photographs corroborate this. As such, the hypothesized origin must have been created by mechanical force in the same manner as the circumferential parting.

2.12.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Because the circumferential parting had initiated from a crack-like surface flaw at a temperature below the steel ductile to brittle transition temperature (DBTT), the micro fracture mode would be cleavage. One would not expect any noticeable change in the micro fracture mode outside of the origin that was produced at the same temperature below the ductile to brittle transition temperature of the steel. This was a temperature driven fracture mode. The absence of a ductile origin is consistent with the low temperature experienced, prior to circumferential parting and after the axial rupture, due to escaping gas. As discussed previously, data from all aspects of the failure (metallurgical, loads, temperatures) should be integrated to deliver a precise interpretation. Just interpreting metallurgical data alone is inadequate. A comprehensive interpretation is crucial to identifying the fracture sequence.

   The SEM images below show the origin was initiated from a crack like surface flaw by cleavage (Figures 169 and 170 on page 141, *SS-25 Casing Failure Analysis* supplementary report).

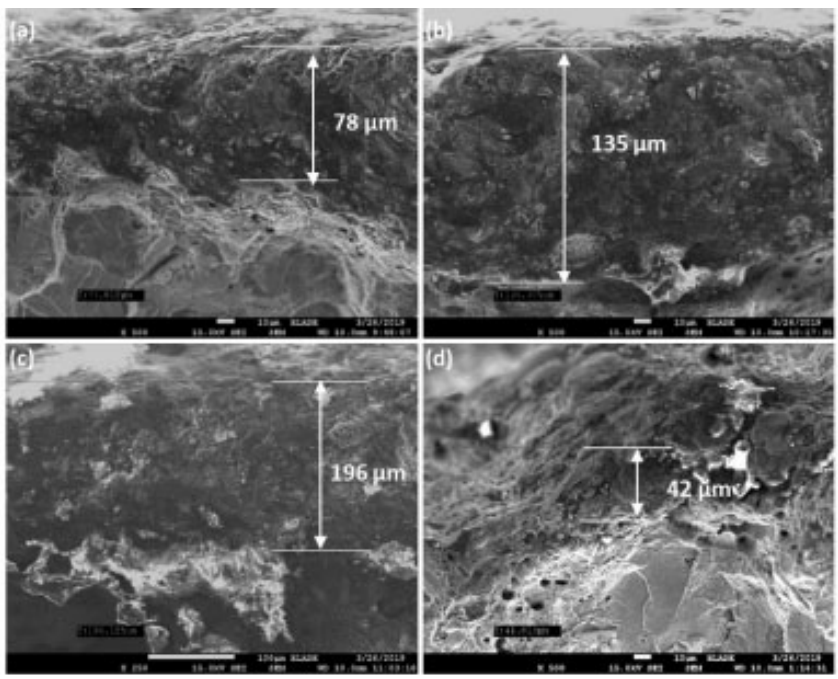
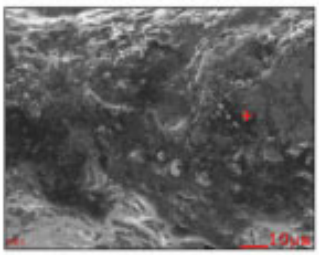
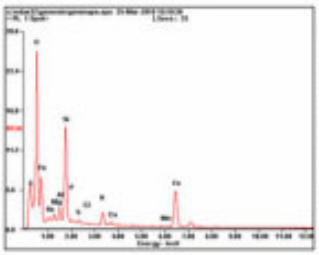


Figure 169: SEM Images of Pre-existing Flaws at (a) 1A, (b) 2A, and (d) 4A Taken at 500×, and (c) 3A Taken at 250×



(a) SEM image. The red spot is where the EDS analysis was performed



(b) EDS Spectra. A high oxygen peak is noticeable

Element	Wt%	At%
CK	09.93	22.27
OK	27.98	47.08
NaK	00.30	00.35
SiK	00.48	00.46
SK	00.24	00.20
ClK	00.51	00.39
CaK	00.24	00.16
MnK	00.71	00.35
FeK	59.62	28.74
Matrix	Correction	ZAF

(c) Concentration of the scale showed iron oxide

Figure 170: EDS Results for Pre-Existing Flaws

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's assertion: that "Blade's scanning electron microscope (SEM) photos of the hypothesized origin show predominantly cleavage features. Blade reported that no noticeable changes in fracture mode were observed outside of the origin and their SEM photographs corroborate this. As such, the hypothesized origin must have been created by mechanical force in the same manner as the circumferential parting", then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.13 Statement 13

Blade's analysis of the circumferential parting is logically flawed. According to Blade's analysis and calculations, the origin was required for circumferential parting to occur as a separate event. But the fracture mode of the origin is the same as that of the circumferential parting, begging the question as to how the origin came into existence, since mechanical loads were insufficient to cause a separate circumferential parting in the absence of the origin.

2.13.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

Blade's analysis of the circumferential parting followed well-established guidelines for determination of the failure origin, and the evidence of discontinuity of chevron marks between circumferential parting and axial rupture provide a sound scientific basis to conclude that the circumferential parting occurred as a separate event. The circumferential fracture mode was a temperature driven process, consequently, the origin has cleavage features that is consistent with fracture under low temperatures.

The rationale for Blade's findings has been discussed in the responses to Statements 10, 11, and 12.

Moreover, as indicated in the previous Statement, on pages 140 – 142 of the *SS-25 Casing Failure Analysis* supplementary report, Blade clearly indicated that "the SEM examination of Zone 1 of the circumferential parting identified a pre-existing, crack-like flaw on the OD side of the origin. The OD surface flaw may have promoted brittle cracking from the origin of the circumferential parting, even though the flaw was shallow". In other words, a brittle crack (i.e., the origin) was initiated from the crack like surface flaw at a temperature below ductile to brittle transition temperature (DBTT) and the brittle crack size was larger than the critical crack size at that temperature, resulting in crack instability and the circumferential brittle parting. One would not expect any noticeable change in micro fracture mode within and outside of the origin that was produced at a temperature below ductile to brittle transition temperature of the steel. This was temperature driven fracture mode.

A complete validation of the size of the origin (critical crack size) is given in Section 2.4.4, pages 74 – 79 of Blade's Main Report and Section 4.3, pages 164 – 169 of the *SS-25 Casing Failure Analysis* supplementary report.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's assertion that "Blade's analysis of the circumferential parting is logically flawed.", then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.14 Statement 14

For there to have been a circumferential fracture separated in time from the vertical fracture, the vertical fracture would have to arrest (stop). There is no fractographic evidence showing arrest of the vertical fracture extending upward from the area of the burst. The vertical fracture extending downward from the area of the burst arrested most likely because it was approaching thicker material at the casing threaded connection.

2.14.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   There are two issues raised here by Mr. Carnahan: (a) there is no fractographic evidence showing arrest of the vertical fracture extending upward from the area of the burst and (b) the vertical fracture extending downward from the area of the burst arrested most likely because it was approaching thicker material at the casing threaded connection. Blade's response to Mr. Carnahan's testimony is as follows:

   Issue (a): there is no fractographic evidence showing arrest of the vertical fracture extending upward from the area of the burst.

   Blade's Response to Issue (a): Blade did provide extensive macro and micro fractographic evidence showing arrest of the vertical fracture extending upward from the area of the burst. The evidence was provided and discussed in the *SS-25 Casing Failure Analysis* supplementary report on page 76 (Figure 78), page 81 (Figure 86, Macro), page 82 (Figure 87, Macro), page 109 (Figures 123, 124, Macro), page 121 (Figures 142 and 143, Macro), page 122 (Figure 144 Micro), page 124 (Figure 146 Micro), and page 146 (Figure 178 Macro).

   As stated in the supplementary report, Figure 78 (page 76) and Figure 86 (page 81) illustrates the upper (upward) turning point, second upper (upward) turning point, and arrest point. The images show the upper (upward) section of the axial rupture. Figure 87 (page 82) shows the lower (downward) turning and arrest points.

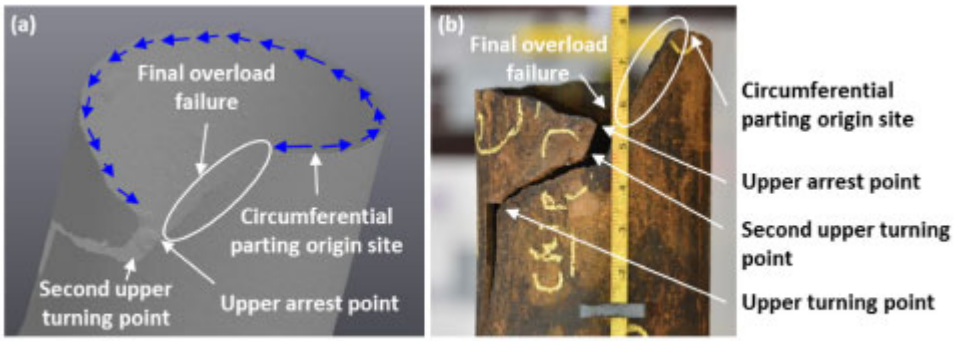


Figure 78: (a) Laser Scan and (b) Circumferential Parting

Figure 86: Macro Image of the Two Upper Turning Points and Single Arrest Point

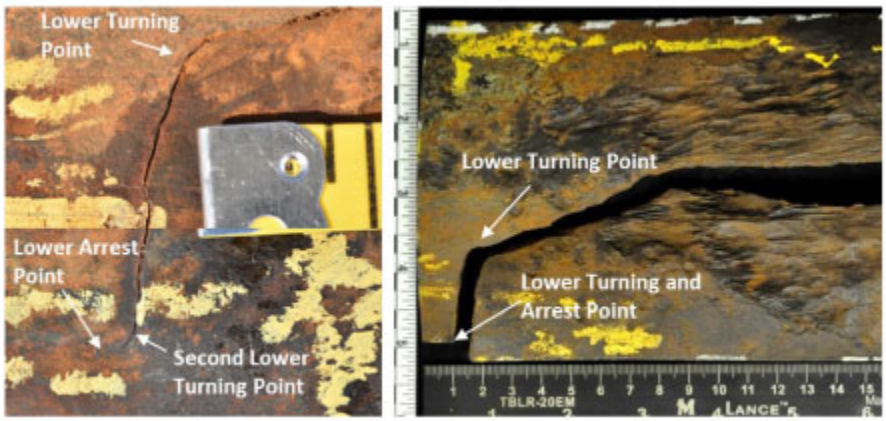


Figure 87: Macro Images of the Lower Turning and Arrest Points

Figure 142 (page 121 in the supplementary report) below shows more detail on the second upper (upward) turning point and upper (upward) arrest area. The upper (upward) arrest area is identified by a slight angle change on the inclined surface. The fracture surface of the upper (upward) arrest area shows no chevron marks because the axial crack was arrested.

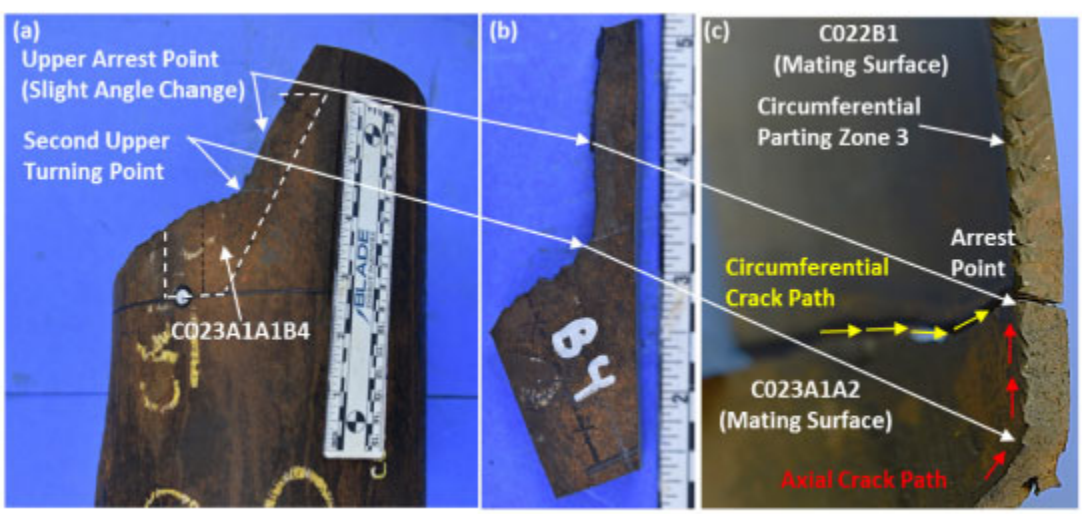


Figure 142: Specimen C023A1A1B4 Extraction

Figure 146 (page 124 of the supplementary report) below are the SEM images of the axial upper (upward) arrest area showing no cleavage facets. There are two observations in the arrest region that support the fact that the crack was arrested. First is the absence of chevron marks observed with a stereo microscope. Secondly, the absence of cleavage facets, observed using a SEM in the same region. Both of these factors support the interpretation that the axial crack slowed down and arrested in this region around a temperature of 80°F. Had the crack propagated per Mr. Carnahan's hypothesis, there should have been chevron marks and cleavage facets in this axial to circumferential transition region, identified as Zone 3.

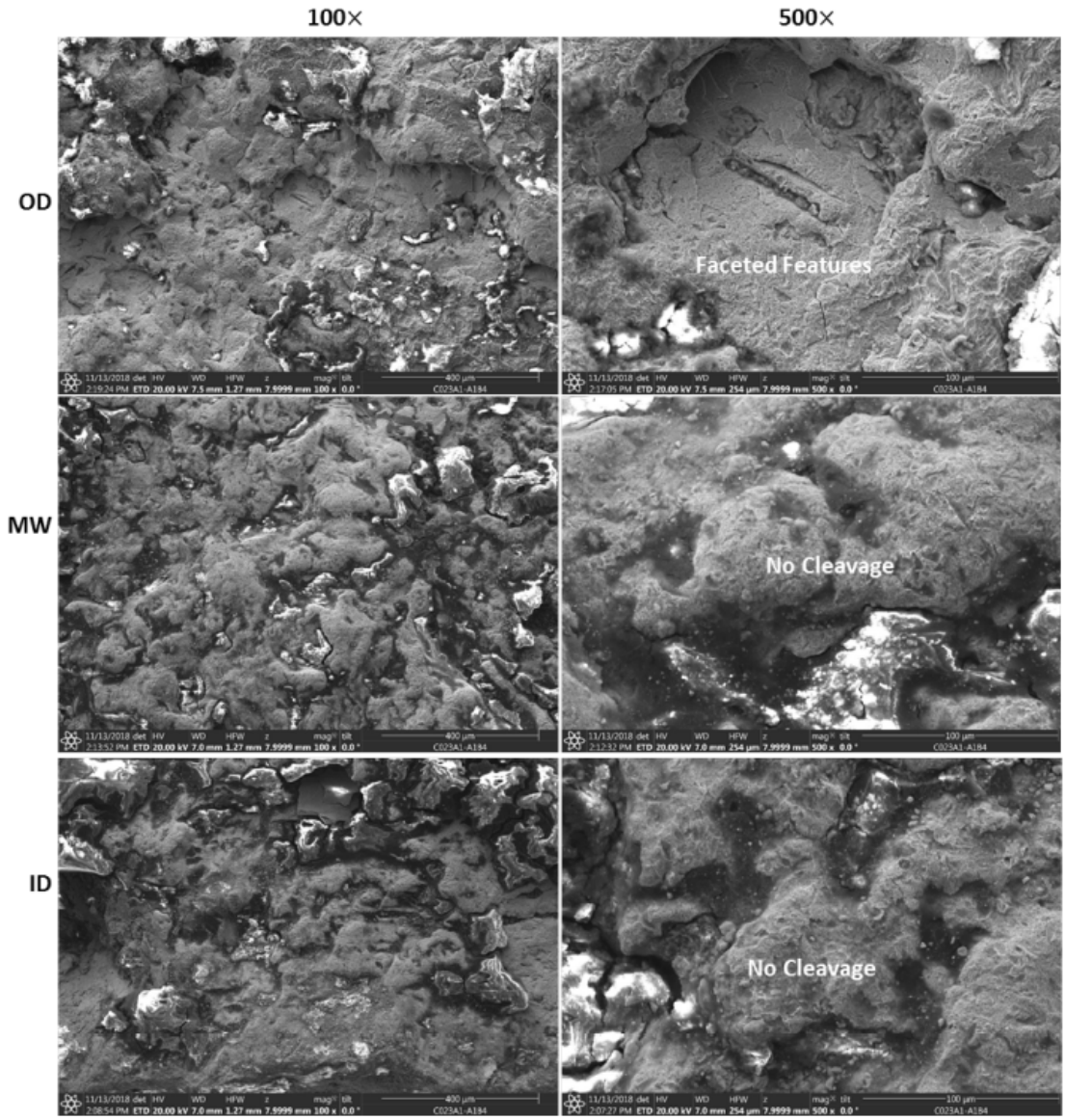


Figure 146: Specimen C023A1A1B4 A3 Showing OD, MW, and ID at 100× and 500×

Figure 178 (a) (page 146 of the supplementary report) shows a schematic of Zone 3 of final circumferential parting. The yellow arrow points to Figure 178 (b) and (c) that show macro and stereo images at a higher magnification of Zone 3. The images show a step-like appearance on the

ID side of the fracture surface. The OD side of the fracture surface appears to be smooth. The fracture surface shows no evidence of chevron marks.

The SEM examination (Figure 180 on page 148 of the supplementary report) showed that the fracture surface near the OD side was mostly cleavage separation, while the ID side showed a mix of cleavage facets and a woody type of plastic deformation. The fracture surface morphology at the mid-wall was a combination of the OD and ID morphologies. This evidence is consistent with the brittle overload failure at temperature below ductile-brittle transition temperature (DBTT).

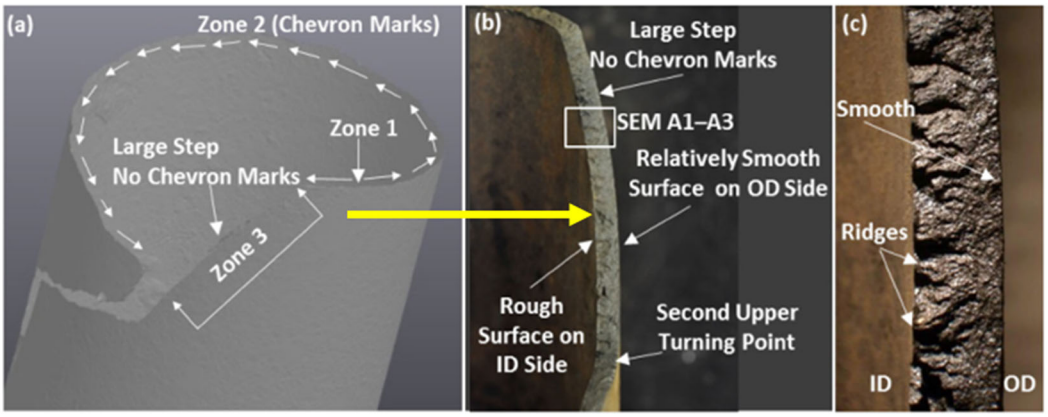


Figure 178: (a) Schematic and (b) (c) Image of Zone 3 (Final Overload Failure)

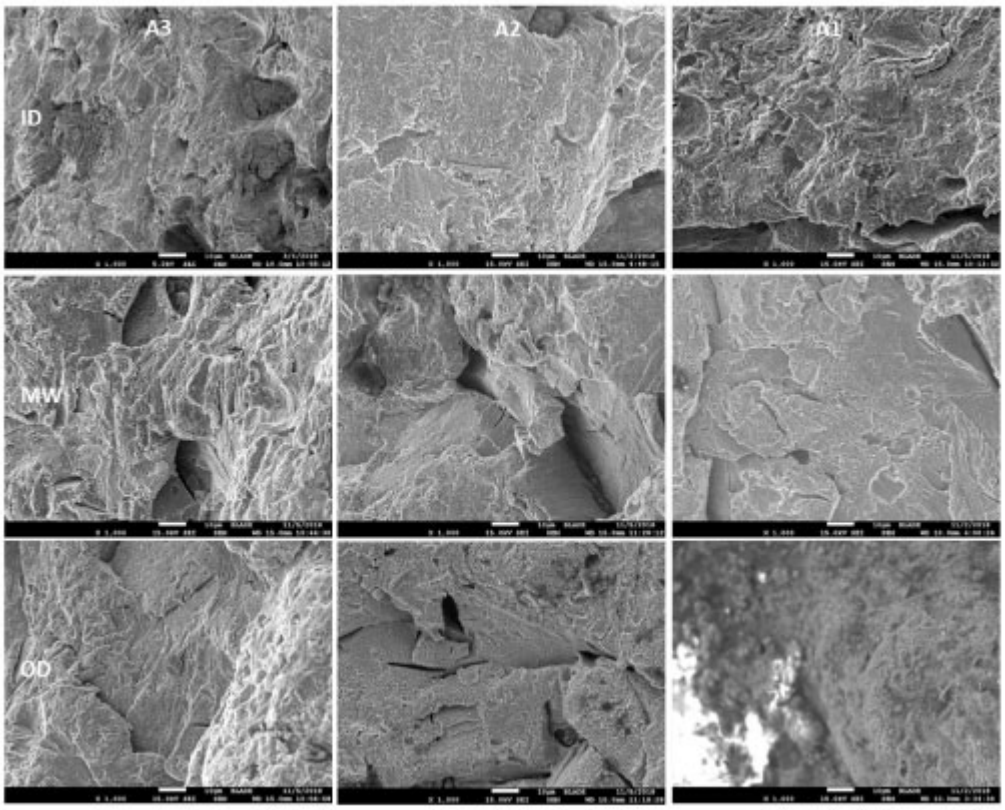


Figure 180: Fracture Surface Morphologies near the ID, MW, and OD Taken at 1,000×

Based on evidence discussed above and other data, Blade's Main Report states on page 54 "Visual and stereoscopic examination of the circumferential parting showed that the failure was not a

continuation of the axial rupture, but rather re-initiated near the corner on one side of the parted casing". If it was a single event from the axial (vertical) rupture to the circumferential parting, there should be a single continuous pathway of chevron marks. The evidence does not support a single event because both the upward arrest area of the axial rupture and Zone 3 of circumferential parting do not contain chevron marks. Therefore, the vertical and circumferential fracture are two separate events with their own initiation sites.

Issue (b): the vertical fracture extending downward from the area of the burst arrested most likely because it was approaching thicker material at the casing threaded connection.

Blade's response to Issue (b): Blade disagrees with Mr. Carnahan's statement that the crack may have arrested at the wall thickness change near the connection. The arrest point was about 9 in. from the start of the change in wall thickness of the casing pin connection, therefore the arrest is not coincident with the wall thickness change. However, Blade does agree that the connection contributed to the lower arrest point. Blade has addressed this issue in its supplementary report *SS-25 Casing Failure Analysis* (Section 3.2.1, page 78). Figure 81 (page 79) shows that the origin was not symmetrically located at the center of the rupture. The non-symmetric location of the origin can be explained by the proximity of the origin to connection 22. The axial crack initiated in Zone 1 and propagated in opposite directions. The lower (i.e., "downward" used by Mr. Carnahan) crack front propagated towards connection 22, which provided additional constraint. Parameters that may contribute to the constraint include connection make up stresses and residual stresses due to local deformation. The upper crack was not influenced by any additional constraint allowing the crack to propagate further before arresting.

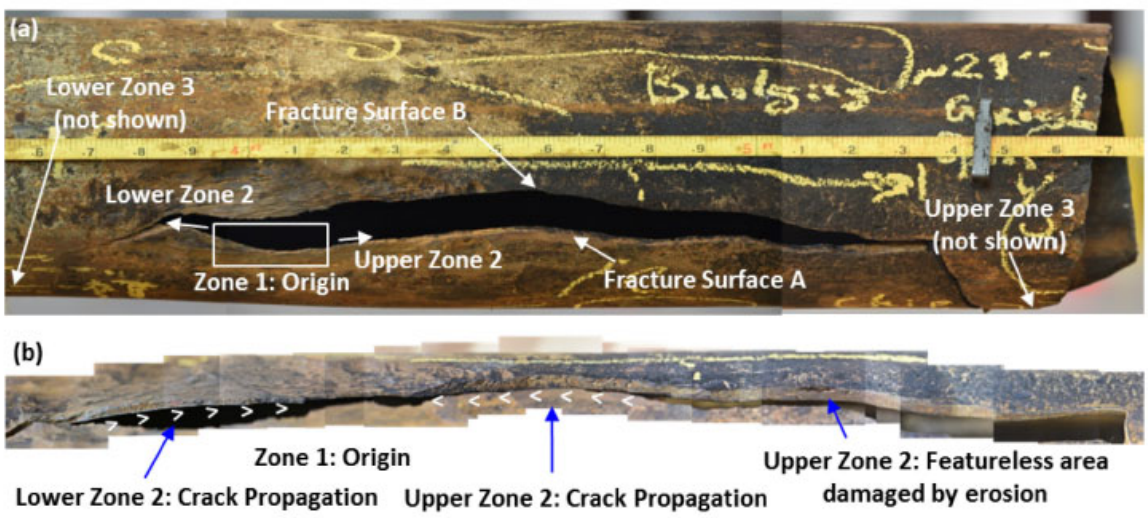


Figure 81: (a) Front and (b) Top Views of Fracture Surface B Identifying Zones 1 and 2

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's assertion then it would only change Blade's interpretation on the failure sequence.

However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.15 Statement 15

The 7-in. casing did not have to become cold for the circumferential fracture to occur. The fracture that extended vertically upward from burst area did not require cooling of the material. Similarly, no further cooling would be required for this fracture to change direction and propagate circumferentially.

2.15.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   There were two events. The axial rupture happened at a temperature around 80°F. However, following the axial rupture the temperature dropped locally, and then the circumferential parting occurred. Blade has provided extensive evidence to support this interpretation.

   Firstly, Mr. Carnahan's testimony "The 7-in. casing did not have to become cold for the circumferential fracture to occur" ignores the evidence provided in Blade's Main Report, is subjective, and without any basis. The fact is, as stated on page 55 in Blade's Main Report, that "the circumferential parting was brittle, which was different from the axial rupture. No evidence of local plastic deformation or overload necking was observed near the fracture surfaces on either side of the circumferential parting" and "a temperature for the circumferential parting was estimated to be in the range of –76°F to –38°F (–60°C to –39°C)" based on the critical defect size and fracture mechanics models (API 579 FAD and BS7910 FAD) (Table 6 on page 79 of the Main Report) and a series of CVN tests (Sections 4.3.1, pages 164 – 166 of the *SS-25 Casing Failure Analysis* supplementary report).

   Mr. Carnahan does not address the absence of local plastic deformation or lack of overload necking in the circumferential parting region, which would be required to validate or support Mr. Carnahan's contention. Further, Mr. Carnahan has not assessed the fact that the tensile load was low and could not have failed the casing in the circumferential orientation unless the temperature dropped and the toughness was reduced. Integration of stresses, metallurgical factors and temperature is necessary here to interpret the failure sequence.

   Secondly, Blade agrees with Mr. Carnahan's testimony that "The fracture that extended vertically upward from burst area did not require cooling of the material". In Blade's Main Report, it is clearly stated that the axial rupture occurred at an estimated temperature of 80°F; this estimate was based on the historical temperature profile data at the failure depth of 892 ft (joint 22) and is consistent with observed bulging and ductile tearing associated with the axial rupture (page 74 in Section 2.4.4 of Blade's Main Report). Blade never states anywhere in the report that the fracture that extended vertically upward from the burst area required cooling of the material.

   Thirdly, Blade disagrees with Mr. Carnahan's statement "Similarly, no further cooling would be required for this fracture to change direction and propagate circumferentially". This statement is

not relevant to the failure at SS-25.There were two events, the axial rupture occurred at 80°F, whereas the circumferential parting occurred at a much lower temperature. This has been previously discussed in detail. There is a preponderance of evidence that supports Blade interpretation.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's conclusion in the above statement. Blade does agree with Mr. Carnahan's testimony "The fracture that extended vertically upward from burst area did not require cooling of the material." This is consistent with Blade's conclusion in its reports. Mr. Carnahan's testimony, if accepted to be true in its totality, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.16 Statement 16

There is no mechanical reason for the upward extending vertical fracture to arrest. The stress intensity at the tip of the fracture, essentially the driving force for fracture, was increasing as the fracture became longer.

2.16.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Fracture mechanics text books [17] [18] [19] and extensive literature [20] [21] [22] [23] [24] have explained the crack arrest concept. The driving force for a running crack is dynamic and decays as a function of time, as described in fracture mechanics text books and literature. It depends on two factors: (a) the rate of internal pressure drop due to the release of liquid or gas and (b) the resistance to crack propagation that is dependent on the material's crack arrest toughness (CVN, KJ, CTOA, etc.). Developing the methods for arrest of a running crack in steels is the focus of fracture mechanics for safety and minimizing consequences of rupture [20] [21] [22]. The evidence provided by the SS-25 RCA has shown that the running axial crack in the SS-25 7 in. casing was arrested.

   Figure 4 presents a schematic of the failure process [25]. The sketch in the red box conceptually summarized the conditions for crack arrest, that is, a through-wall defect ruptures but arrests if the pressure is low, and/or if the pipe material toughness is high.

   The differential pressure at the time of the SS-25 7 in. casing axial rupture was 2,405 psi (Table 5, page 156, *SS-25 Casing Failure Analysis* supplementary report), the calculated hoop stress is only

42.6% of actual yield strength, which was a low stress failure, i.e., a low driving force for failure. On the other hand, the temperature at the time of the axial rupture was 80°F. The material exhibited high ductility and toughness. Therefore, this was a low driving force and high resistance failure condition, which falls in the crack arrest category. Therefore, the upward crack would eventually be arrested.

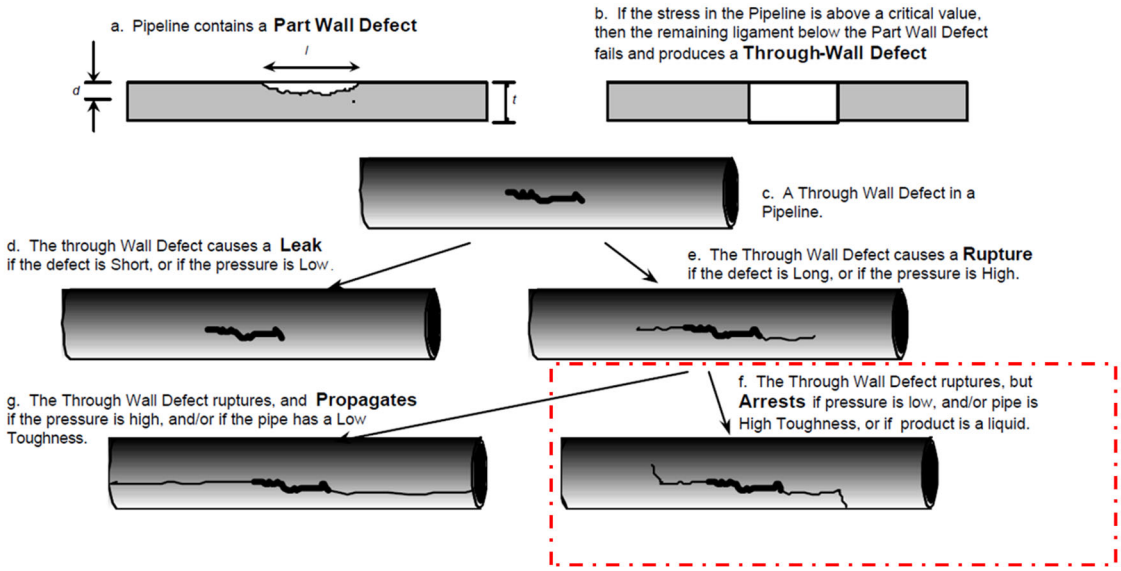


Figure 4: Pipe Failure Process

The crack arrest phenomenon as observed in the SS-25 7 in. casing has been discussed in literature, for example ASM Handbook Volume 12 *Fractography Visual Examination and Light Microscopy* and Vol. 20 *Material Selection and Design Chapter Using Failure Analysis in Material Selection*. The figure below is reproduced from ASM Vol 20 showing the arrested axial crack in a full section of X60 grade line pipe by ductile fracture at 13°C (56°F) which is 8°F above its 50% shear-area. The crack, moving at 278 ft/s (85 m/s), stopped after a short distance. The fracture was ductile and the line pipe was tough enough at this temperature to arrest the crack.

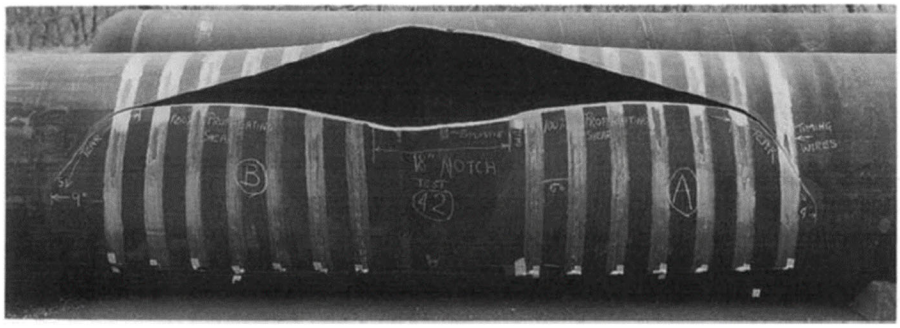


Fig. 1 Ductile fracture of a full section X60 grade line pipe tested at 56 °F (13 °C), which is 8 °F above its 50% shear-area DWTT

Therefore, Blade disagrees with Mr. Carnahan's statement "There is no mechanical reason for the upward extending vertical fracture to arrest. The stress intensity at the tip of the fracture, essentially the driving force for fracture, was increasing as the fracture became longer". This statement is inconsistent with literature data and understanding regarding running cracks and crack arrest phenomena. Blade supplementary report, *SS-25 Failure Analysis*, on page 73 states,

"The visual examination showed that during the axial rupture, plastic bulging occurred first with slow ductile tearing due to the internal pressure. Tearing instability occurred once the axial flaw reached the critical size and was followed by a rapid crack propagation in the axial direction that left behind chevron marks (Figure 76 [c]). The crack changed direction (upper and lower turning points) and finally arrested due to dynamic energy consumption (17) (18) (19). There were two turning points on the upper and lower side of the rupture. This phenomenon is not uncommon for an axial rupture."

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   Blade does not accept any part of Mr. Carnahan's statement as true. If Blade were to accept Mr. Carnahan's assertion that "There is no mechanical reason for the upward extending vertical fracture to arrest. The stress intensity at the tip of the fracture, essentially the driving force for fracture, was increasing as the fracture became longer", then it would only change Blade's interpretation on the failure sequence. However, it would not change the failure analysis conclusions. The failure was caused by 85% metal loss due to external corrosion. It would not change any of the RCA conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable, no conclusions change.

2.17 Statement 17

Pages 28-30 of Mr. Carnahan's testimony, which states:

The cooling shown on the SS-25 temperature logs at this depth was not indicative of a leak. The movement of gas into or out of the storage zone always causes localized cooling; indeed, cooling behavior where a storage well meets the reservoir has been well known for many years, as can be seen in Figure 19.

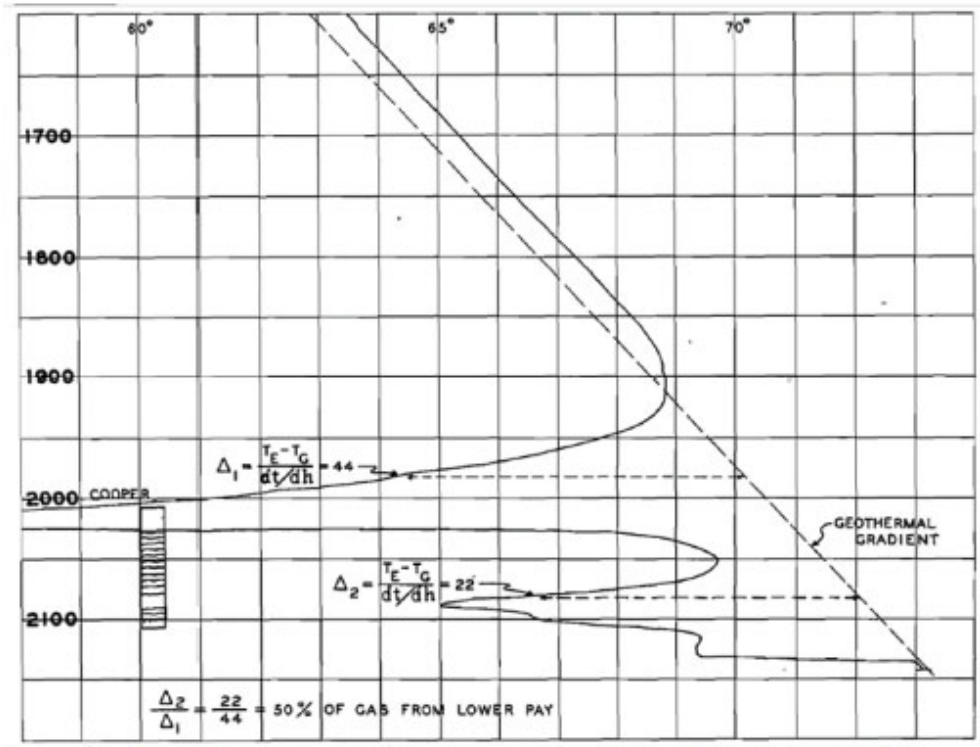


Figure 19. Gas well temperature log showing cooling at the packer and perforation (Bird, 1954).

2.17.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

   Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   Blade discussed this phenomenon in supplementary report *SS-25 Temperature, Pressure, and Noise Log Analysis* [26, p. 16].

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.18 Statement 18

All storage wells at Aliso Canyon exhibit the same or similar cooling at that depth. For example, Figure 20 shows that Fernando Fee 32A and Porter 72A both exhibit cooling at the bottom of the wells, and the same is true for SS-25A and SS-25B (Figure 21).

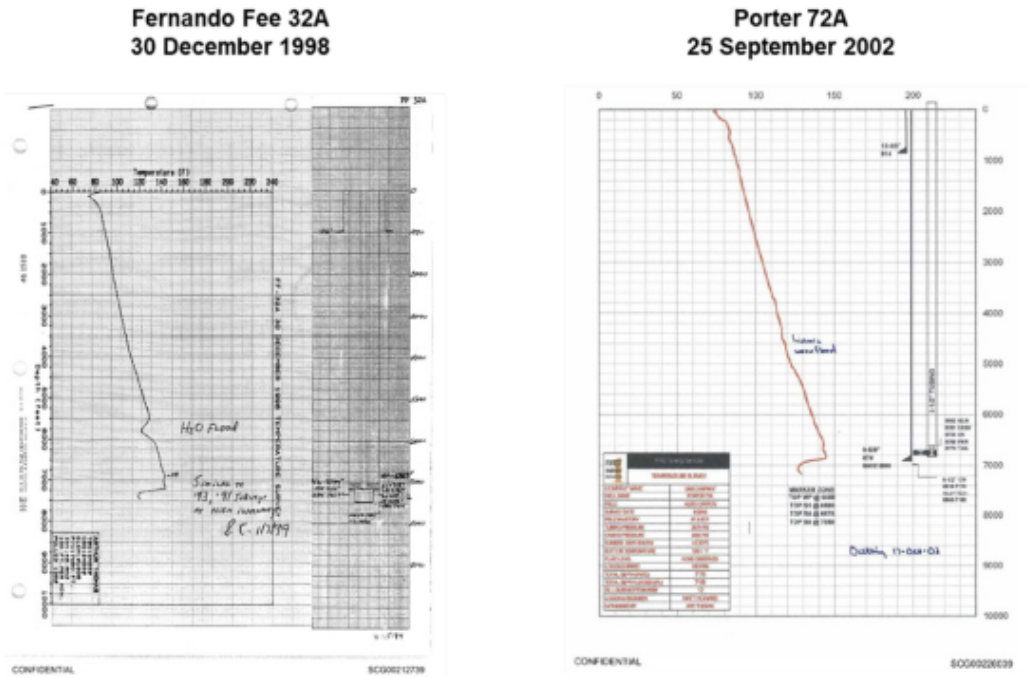


Figure 20. Temperature logs for Fernando Fee 32A (left) and Porter 72A (right).

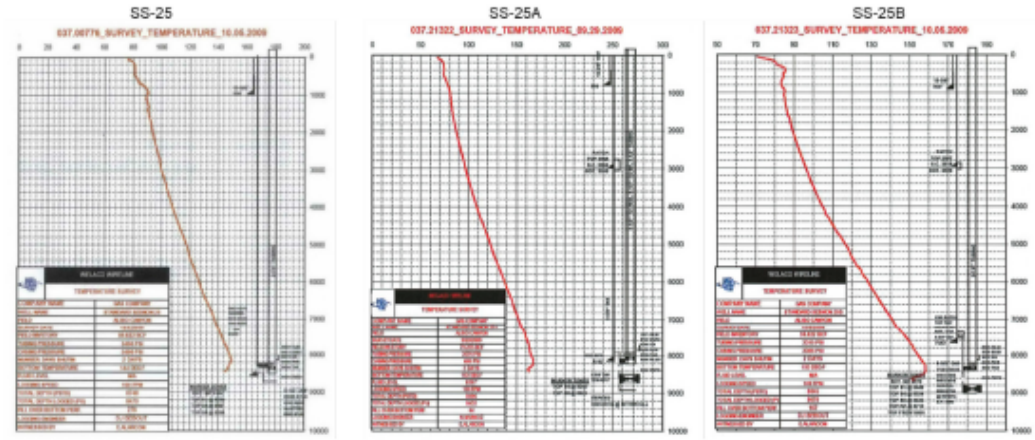


Figure 21. Temperature logs taken in 2009 in wells SS-25, SS-25A, and SS-25B.

2.18.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   Blade agrees with this statement, and has discussed the cooling in a supplementary report [27, p. 16].

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.19 Statement 19

Some temperature surveys over the years reported possible slight leakage in the vicinity of the production casing shoe and noise logs were run following a number of these temperature surveys. SoCalGas performed noise logs in SS-25 on the following ten dates: September 8, 1978, December 11, 1978, August 8, 1979, November 24, 1981, February 23, 1983, April 11, 1984, July 27, 1984, November 7, 1991, November 7, 2006, and June 1, 2012. None of these noise logs indicate a gas leak in the production casing. None of these noise logs indicate a gas leak in the production casing or at the production casing shoe.

2.19.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Blade agrees with, "None of these noise logs indicate a gas leak in the production casing."

   Blade disagrees with, "None of these noise logs indicate a gas leak . . . at the production casing shoe."

2. If Blade disagrees with any portion of the statement, why?

   One of the noise logs, performed on April 11, 1984, identified a possible leak near the production casing shoe. Multiple temperatures logs and a radioactive tracer survey were run during this period. This casing shoe leak was not observed in subsequent noise logs. More importantly, there was never any indication via noise or temperature logs of any casing integrity issues prior to October 23, 2015 incident.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   Figure 5 shows the April 11, 1984 log [28]. Denoted in yellow in the Results and Remarks section is, "POSSIBLE SLIGHT SHOE LEAKAGE MIGRATING HIGHER THAN 8440'" at a shut-in pressure of 1,595 psi. Note the purpose of the survey was to "CHECK FOR SHOE LEAK".

   Figure 6 shows the July 27, 1984 log [29]. Denoted in yellow in the Results and Remarks section, "NO INDICATION OF ANY GAS LEAKAGE" at a shut-in pressure of 2,390 psi. Also note the purpose of the survey was to "TO CHECK FOR GAS LEAKAGE AT THE CASING SHOE AND/OR THE W. S. O. ". The W. S. O. refers to the water shut off perforations.

The shut-in tubing and casing pressures during the July 27, 1984 noise survey is 795 psi higher than during April 11, 1984 noise survey. Leaks are almost always more prominent when the pressures are higher. If the casing shoe leak was present it should have been evident at the higher pressure (i.e., inventory) and observed on the July 27, 1984 noise log and subsequent logs.

PERMANENT DATUM	6' K.B.	ELEVATION	2927'
LOG MEASURED FROM	6' AGL.	CORRECTED TO	TUBING MAIL
TOTAL DEPTH	8748'	OBSERVED DEPTH (Pickup)	8709
TOP OF LOGGED INTERVAL	200	BOTTOM LOGGED INTERVAL	8709
TYPE OF FLUID IN HOLE	GAS	FLUID LEVEL	?
LOG RECORDED BY	CLARK & HELMS	WITNESSED BY	BRET LANE

CASING AND TUBING RECORD

Size	Weight	From	To
11-3/4"	42	0	990
7	23	0	8585
5-1/2	20	8559	8748

WELL STATUS SHUT-IN GAS STORAGE

Pressure	Flowing	Injecting	Shut-in
TBG			1595
CSG			1595

INJ. RATE TYPE

OBS. RATE

PRODUCTION: Oil Gravity: °API

Water

Gas

BOTTOM TEMPERATURE

TUBING SIZE 2-7/8 DEPTH 8496

PACKER(S) 8491

MANDREL(S) 8405

PERFORATIONS 8510-38, 8542-8559' 8592-8748'

LOGGING UNIT 711 LINE SIZE 3/16" LINE LENGTH 20,000'

TOOLS USED 5' BAR 5' BAR 5' BAR CCL TEMP NOISE

TOOL NUMBERS 4030

DIAMETER 1-3/8'

RESULTS AND REMARKS: POSSIBLE SLIGHT SHOE LEAKAGE MIGRATING HIGHER THAN 8440' (NOTE TEMPERATURE BREAK AROUND 6800'.)

COMPANY SOUTHERN CALIFORNIA GAS

WELL NO. STANDARD SESNON No. 25

FIELD ALISO CANYON

COUNTY LOS ANGELES STATE CA

DATE 4-11-84

FLO-LOG INC.

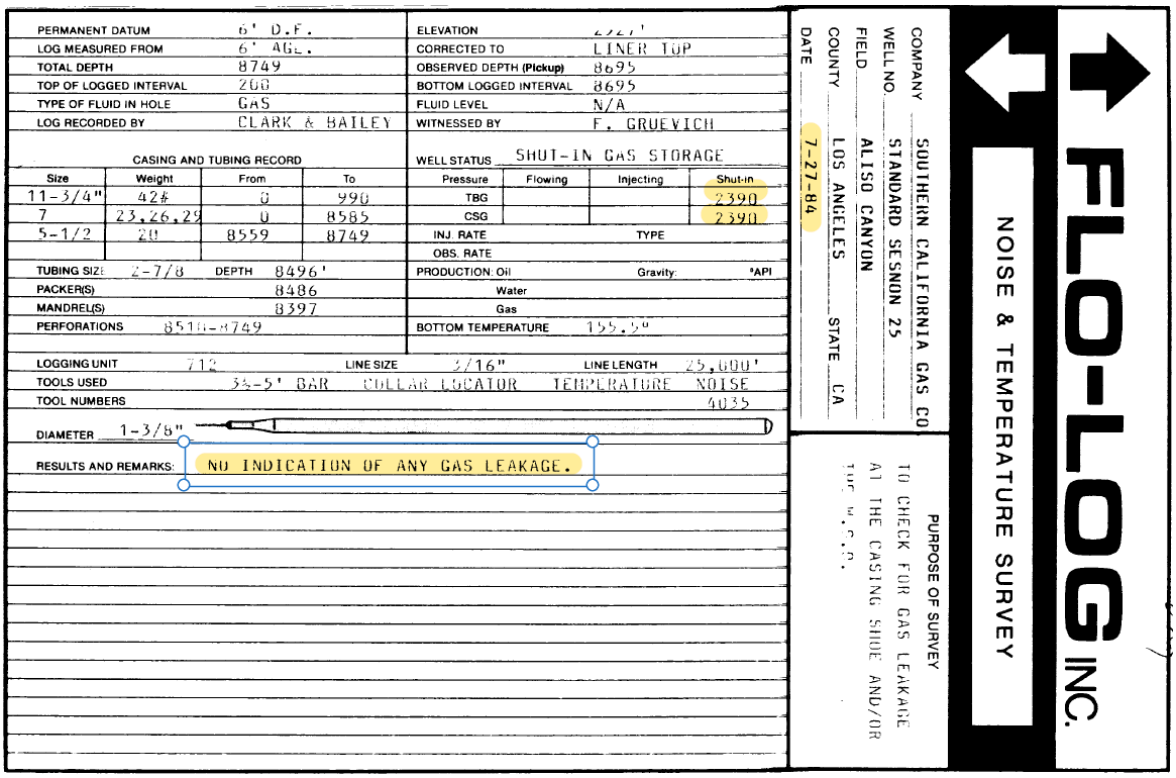
NOISE AND TEMPERATURE SURVEY

PURPOSE OF SURVEY

CHECK FOR SHOE LEAK.

Dcg

Figure 5: SS-25, Noise Log Header on April 11, 1984, "Possible Slight Shoe Leakage", 1,595 psi



PERMANENT DATUM	6' D.F.	ELEVATION	2327'
LOG MEASURED FROM	6' AGL.	CORRECTED TO	LINER TOP
TOTAL DEPTH	8749	OBSERVED DEPTH (Pickup)	8695
TOP OF LOGGED INTERVAL	200	BOTTOM LOGGED INTERVAL	8695
TYPE OF FLUID IN HOLE	GAS	FLUID LEVEL	N/A
LOG RECORDED BY	CLARK & BAILEY	WITNESSED BY	F. GRUEVICH

WELL STATUS: SHUT-IN GAS STORAGE

CASING AND TUBING RECORD

Size	Weight	From	To
11-3/4"	42#	0	990
7	23,26,29	0	8585
5-1/2	20	8559	8749

Pressure	Flowing	Injecting	Shut-in
TBG			2390
CSG			2390

INJ. RATE TYPE
OBS. RATE

TUBING SIZE 2-7/8 DEPTH 8496'
PACKER(S) 8486
MANDREL(S) 8397
PERFORATIONS 8510-8749

PRODUCTION: Oil Gravity: °API
Water
Gas
BOTTOM TEMPERATURE 155.5°

LOGGING UNIT 712 LINE SIZE 3/16" LINE LENGTH 25,000'
TOOLS USED 3½-5' BAR COLLAR LOCATOR TEMPERATURE NOISE
TOOL NUMBERS 4035
DIAMETER 1-3/8"
RESULTS AND REMARKS: NO INDICATION OF ANY GAS LEAKAGE.

FLO-LOG INC.
NOISE & TEMPERATURE SURVEY
COMPANY SOUTHERN CALIFORNIA GAS CO
WELL NO. STANDARD SESNON 25
FIELD ALISO CANYON
COUNTY LOS ANGELES STATE CA
DATE 7-27-84
PURPOSE OF SURVEY
TO CHECK FOR GAS LEAKAGE AT THE CASING SHOE AND/OR TOP OF C.C.

Figure 6: SS-25, Noise Log Header on July 27, 1984, "No Indication of Any Gas Leakage", 2,390 psi

There is a supplementary report titled *SS-25 Temperature, Pressure, and Noise Logs Analysis* [26], and the focus of that report was to assess any evidence of any pre-existing casing integrity issue on SS-25. No temperature, pressure, or noise anomalies in the surveys indicated a preexisting casing failure before the October 23, 2015 incident [9, p. 31]. Casing shoe leaks (i.e., gas from storage zone traveling out of that zone behind casing) were not the focus – these types of leaks would not have any bearing on the corrosion and subsequent casing failure at 892 ft.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change. There were no indications of a preexisting casing integrity issue.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   No conclusion changes are needed.

2.20 Statement 20

A radioactive tracer survey performed on July 29, 1984 reported possible slight leakage behind pipe from top perf at 8510 ft up to around 8430 ft and 8190 ft. This survey indicates gas flowing up to the bottom of the cap rock at approximately 8182 ft and into the permeable S1 formation.

2.20.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

   Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   See the response to Statement 18 question 3.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change. There were no indications of a preexisting casing integrity issue.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.21 Statement 21

The noise logs display four curves, representing sound at frequencies of 200 Hz, 600 Hz, 1,000 Hz, and 2,000 Hz, respectively. Low frequency noise (200 and 600 Hz) is usually indicative of surface noise or low rate flow of fluids behind casing. High frequency noise (1,000 and 2,000 Hz) is usually indicative of the flow of gas, bubbling of gas in liquids, or high-rate gas flow. The interpretation of noise logs is well-established: a sharply-defined, high-frequency noise over a short length of casing is an indication of a gas leak.

2.21.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

   Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change. There were no indications of a preexisting casing integrity issue.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.22 Statement 22

There are no such sharply-defined, high-frequency noises over short lengths of casing in the SS-25 noise logs that would indicate the presence of a gas leak. In some of the logs, there is a noticeable sharp peak in noise, but these were caused by the operators testing the noise logging tool prior to entering the

completion equipment at or below 8,000 ft., and these operator tests are clearly labeled on the logs (see, e.g., November 24, 1981 log).

2.22.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

   Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change in the conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.23 Statement 23

SoCalGas performed the noise log of December 11, 1978 from 5,800 to 7,770 ft., and that log measured no anomalous noise. The logs of November 7, 2006 and June 1, 2012 were performed for the entire length of the well and measured no anomalous noise.

2.23.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Agree.

2. If Blade disagrees with any portion of the statement, why?

   Not applicable. Blade agrees with the statement.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change in the conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.24 Statement 24

SoCalGas performed the remaining noise logs performed in 1978, 1979, 1981, 1984 (2 runs), and 1991 to assess potential leaks. All logs measured generally shallow low frequency noise (200 to 600 Hz). These low-frequency measurements are interpreted to originate from surface noise at the Aliso Canyon site or operations in nearby wells, which is common and described by McKinley [1995].84 The 1978 log includes operator comments referencing surface noise.

2.24.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   In general, Blade agrees with this statement. Noise originating from surface was detected in some logs and this source of the noise was documented in the Results and Remarks section of the log.

2. If Blade disagrees with any portion of the statement, why?

   Blade disagrees with, "All logs measured generally shallow low frequency noise (200 to 600 Hz)." Some, but not all, logs have measured shallow noise.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change in the conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

2.25 Statement 25

The same six logs also measured noise across all four frequency ranges slightly above the packer and completion equipment at the base of the well, and across the storage formation. Such noise is expected and is associated with movement of gas in the storage formation and through the completion equipment. The 1991 log includes operator comments regarding noise interpreted as "bubbling" at a depth of about 7,500 ft., which is shown in the excerpt of the log in Figure 22. As can be seen in the figure, the noise log was repeated over the depth range of 7,200 ft. to 7,600 ft. and the indicated bubbling noise was not detected.

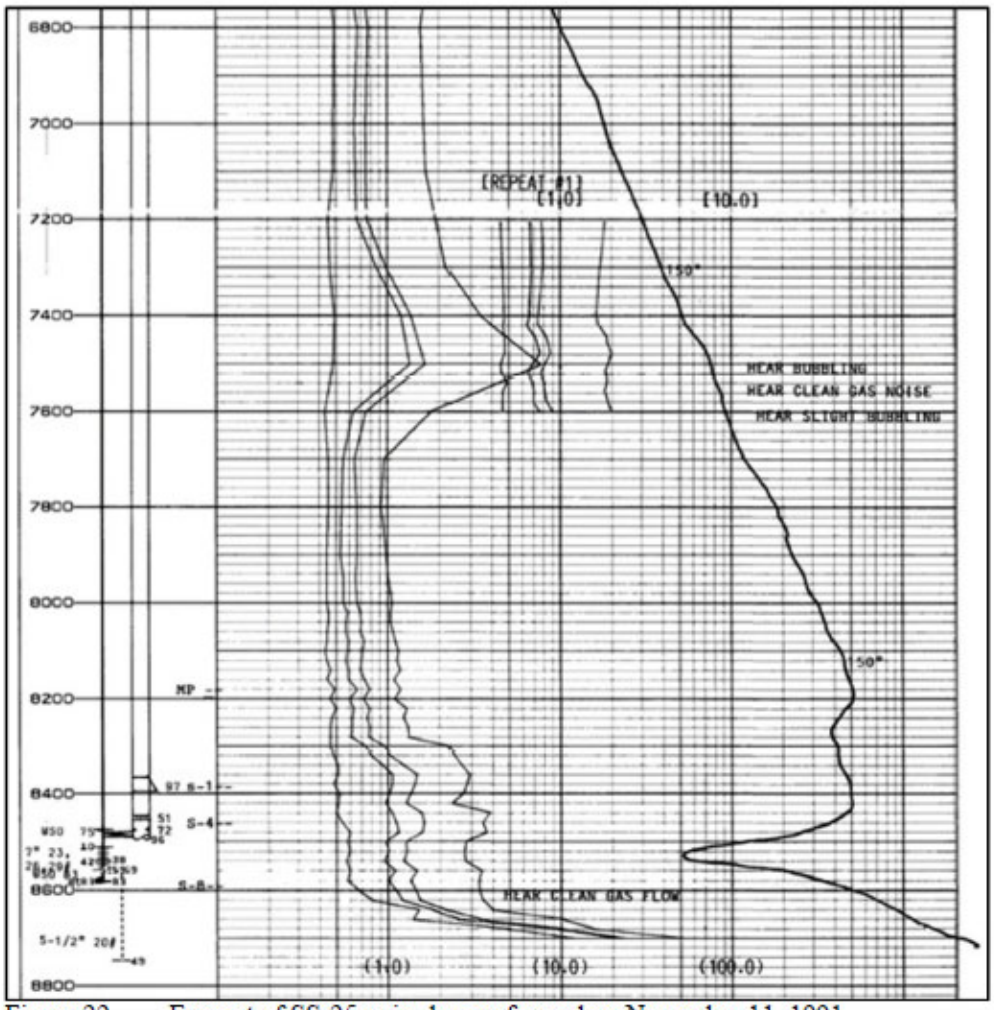


Figure 22. Excerpt of SS-25 noise log performed on November 11, 1991.

2.25.1 Blade Response

1. Does Blade Energy Partners agree or disagree with the statement?

   Disagree.

2. If Blade disagrees with any portion of the statement, why?

   Blade disagrees with "The same six logs also measured noise across all four frequency ranges slightly above the packer and completion equipment at the base of the well, and across the storage formation." Not all the logs were run across the packer, completion equipment and storage formation. For example, in the December 8, 1978 log, the deepest observation point was approximately 7,900 ft, which is above the packer and storage formation.

   Blade agrees that in the repeat section from 7,200–7,800 ft bubbling noise was not detected.

3. Is there any context either in or outside of Mr. Carnahan's testimony that Blade wishes to add in order to explain its answers? If so, please provide it and explain.

   No.

4. If Blade accepts any part of the statement as true, does it change any of the conclusions Blade reached in its Root Cause Analysis?

   No change in the conclusions.

5. If the answer to question 3 is yes, which conclusions change and what must they say now?

   Not applicable. No conclusion changes are needed.

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R-8-26-92

FLO-LOG INC.

NOISE AND TEMPERATURE SURVEY

COMPANY Southern Cal. Gas FIELD Aliso Canyon WELL NAME & NO. Standard Sesnon 25

SURVEY DATA

DATE OF SURVEY	11-7-91
WELL STATUS	GAS STORAGE
TYPE OF FLUID	GAS WATER
FLUID RATE (S)	
EFFECTIVE DEPTH	8748'
LOGGER'S DEPTH (PICKUP)	8700'
AMOUNT OF FILL	48'
LOG WITNESSED BY	B. HAZEL
LOG RECORDED BY	M. FINDLAY
REASON FOR SURVEY	CHECK FOR POTENTIAL LEAKAGE PAST SHOE AS HIGH AS 8150'
RESULTS AND REMARKS:	FIELD INVENTORY WAS 56.478 Bcf. WELL AND FIELD SHUTIN 6 DAYS PRIOR TO SURVEY. HEARD DISTANT NOISE ABOVE 1200'. AT 500', BLED CASING KILL LINE ON WELL 25 A AND HEARD EVEN HIGHER ACTIVITY.

WELLBORE DATA

	SIZE	WEIGHT	CASING AND TUBING RECORD FROM	TO	PRESSURE	FLUID LEVEL
	11-3/4"	42#	0'	990'		
	7"	23,26,29#	0'	8585'	2460 PSI	
	5-1/2"	20#	8559'	8748'		
	2-7/8"	TUBING	0'	8496'	2600 PSI	NONE OBS

PACKER (S) 8486' MANDREL (S) MMG 8397', SSSV 8451'

PERFORATIONS 8510-8538', 8542-8549', JSPF 8592-8748' SLOTTED

LOGGING UNIT 712 LINE SIZE 3/16" LINE LENGTH 24,600 NOISE TOOL NO. 7102

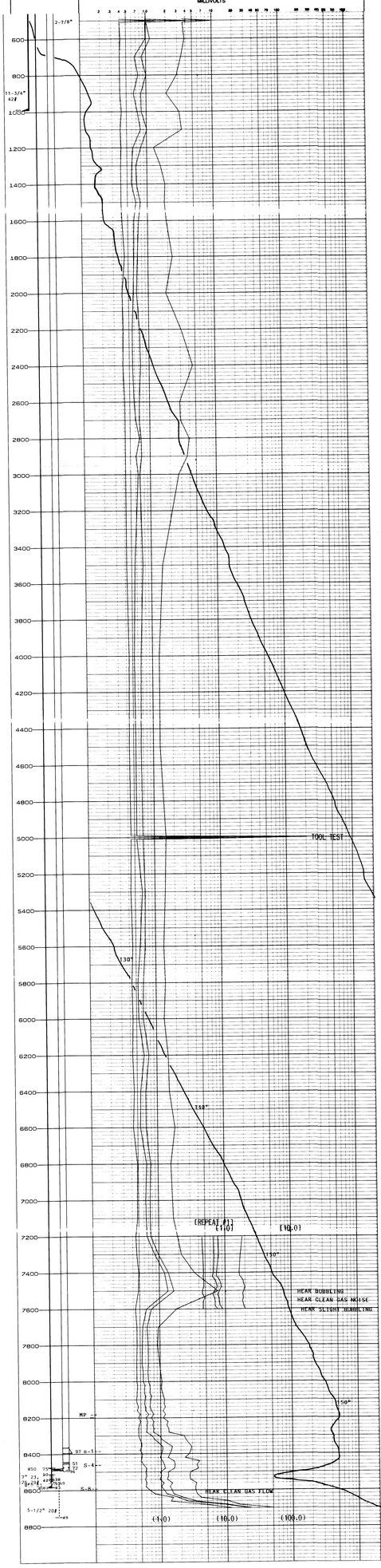
DIAGRAM OF TOOLS USED: C 1

DIAMETER OF TOOLS 1-3/8"

3-60" BARS, COLLAR LOCATOR, TEMPERATURE, NOISE

MEASUREMENT DATUM 6' K.B.

DEPTH REFERENCE TUBING TAIL



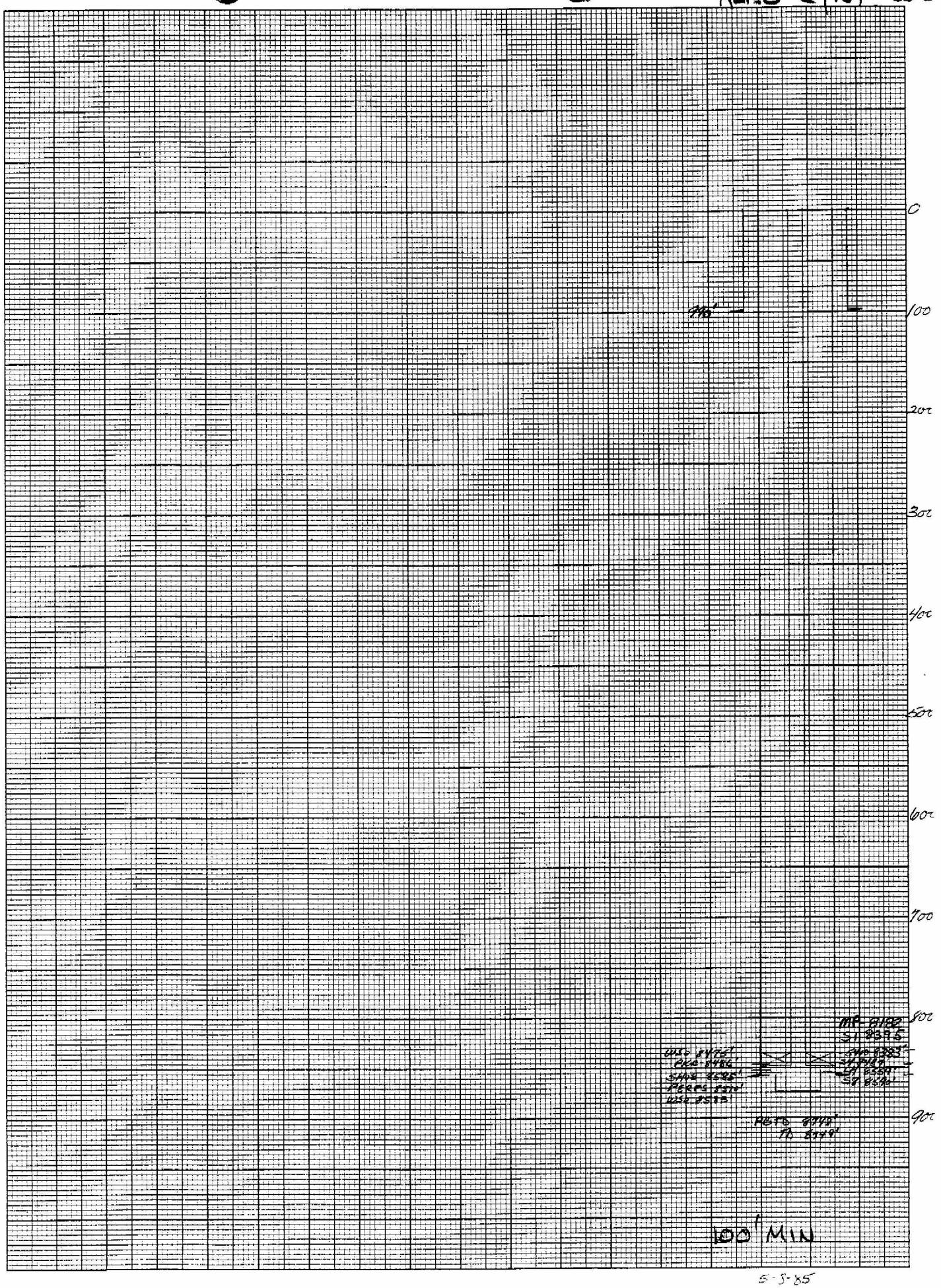
46 1510

K+E 10 X 10 TO THE CENTIMETER 18 X 25 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

SED SUR_REPLY_001392

AC_CPUC_0000294

ALISO CYN, SS 2



5-5-85

461510

K+E 10 X 10 TO THE CENTIMETER 18 X 25 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

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*****************************************
*            The Gas Company            *
*              Aliso Canyon             *
*            (805) 253-7086             *
*****************************************
```

COMPANY NAME..: SO. CAL. GAS
DATE .....: 10/19/95
WELL I.D. ....: SS-25
FIELD I.D. ...: ALISO CYN.
RUN # .....: 1
ENGINEER .....: A. THOMAS
ZERO REFERENCE: K.B.
START DATE ...: 10/12/95
START TIME ...: 00:00:00
WELL STATUS...: S.I.
GAUGE INFO:
  I.D. .....: RT-7
  SERIAL #....: 68482
  RANGE.....: 51-286

COMMENTS .....: TBG. 2560
                CSG. 2560
FILE # .....: 3

STATISTICS:
  DEPTH(min): 0.00
  DEPTH(max): 8675.00
  TEMPERATURE(min): 69.79
  TEMPERATURE(max): 167.16

NO.	DEPTH DEFL(IN)	DEPTH FEET	TEMPERATURE DEFL(IN)	TEMPERATURE F	GRADIENT
1	0.0000	0.000	0.0453	69.79	0.0000
2	0.0282	100.338	0.0518	72.55	0.0275
3	0.0563	200.321	0.0567	74.63	0.0208
4	0.0844	300.304	0.0587	75.48	0.0085
5	0.1125	400.286	0.0533	73.19	-0.0229
6	0.1406	500.269	0.0601	76.07	0.0289
7	0.1688	600.607	0.0644	77.90	0.0182
8	0.1968	700.234	0.0696	80.10	0.0221
9	0.2249	800.216	0.0731	81.59	0.0149
10	0.2530	900.199	0.0753	82.52	0.0093
11	0.2812	1000.537	0.0767	83.12	0.0059
12	0.3092	1100.164	0.0794	84.26	0.0115
13	0.3373	1200.147	0.0816	85.19	0.0093
14	0.3654	1300.129	0.0830	85.79	0.0059
15	0.3937	1400.823	0.0851	86.68	0.0088
16	0.4217	1500.450	0.0874	87.65	0.0098
17	0.4497	1600.077	0.0897	88.63	0.0098
18	0.4779	1700.415	0.0919	89.56	0.0093
19	0.5060	1800.398	0.0945	90.67	0.0110
20	0.5341	1900.380	0.0965	91.52	0.0085
21	0.5621	2000.007	0.0985	92.36	0.0085
22	0.5904	2100.701	0.1008	93.22	0.0085
23	0.6184	2200.328	0.1031	93.84	0.0062
24	0.6466	2300.667	0.1054	94.46	0.0062
25	0.6746	2400.293	0.1078	95.11	0.0065
26	0.7028	2500.632	0.1103	95.78	0.0067

****
* The Gas Company *
****

Company ..: SO. CAL. GAS
Well I.D..: SS-25
Field I.D.: ALISO CYN.

Date: 10/19/95
Run#: 1
Page: 2

NO.	DEPTH DEFL(IN)	DEPTH FEET	TEMPERATURE DEFL(IN)	TEMPERATURE F	GRADIENT
27	0.7309	2600.614	0.1131	96.54	0.0076
28	0.7589	2700.241	0.1159	97.29	0.0076
29	0.7870	2800.224	0.1193	98.21	0.0092
30	0.8151	2900.206	0.1218	98.89	0.0068
31	0.8432	3000.189	0.1236	99.37	0.0049
32	0.8714	3100.527	0.1274	100.40	0.0102
33	0.8995	3200.510	0.1312	101.42	0.0103
34	0.9277	3300.848	0.1350	102.45	0.0102
35	0.9556	3400.119	0.1385	103.40	0.0095
36	0.9837	3500.102	0.1419	104.31	0.0092
37	1.0119	3600.440	0.1463	105.50	0.0118
38	1.0400	3700.422	0.1505	106.64	0.0113
39	1.0680	3800.049	0.1547	107.77	0.0114
40	1.0961	3900.032	0.1587	108.85	0.0108
41	1.1244	4000.726	0.1626	109.90	0.0105
42	1.1525	4100.709	0.1678	111.31	0.0140
43	1.1806	4200.691	0.1744	113.09	0.0178
44	1.2086	4300.318	0.1810	114.87	0.0179
45	1.2368	4400.656	0.1858	116.17	0.0129
46	1.2649	4500.639	0.1914	117.68	0.0151
47	1.2930	4600.621	0.1970	119.19	0.0151
48	1.3211	4700.604	0.1997	119.92	0.0073
49	1.3492	4800.587	0.2053	121.06	0.0114
50	1.3772	4900.213	0.2101	122.02	0.0096
51	1.4053	5000.196	0.2139	122.78	0.0076
52	1.4335	5100.534	0.2191	123.82	0.0104
53	1.4617	5200.873	0.2228	124.56	0.0074
54	1.4897	5300.499	0.2286	125.72	0.0116
55	1.5177	5400.126	0.2327	126.54	0.0082
56	1.5458	5500.109	0.2415	128.30	0.0176
57	1.5741	5600.803	0.2473	129.46	0.0115
58	1.6021	5700.430	0.2528	130.56	0.0110
59	1.6301	5800.056	0.2604	132.08	0.0153
60	1.6582	5900.039	0.2666	133.32	0.0124
61	1.6865	6000.733	0.2717	134.34	0.0101
62	1.7146	6100.716	0.2788	135.76	0.0142
63	1.7426	6200.342	0.2848	136.96	0.0120
64	1.7707	6300.325	0.2920	138.40	0.0144
65	1.7989	6400.663	0.2990	139.80	0.0140
66	1.8270	6500.646	0.3080	141.30	0.0150
67	1.8551	6600.629	0.3171	142.79	0.0148
68	1.8831	6700.255	0.3250	144.08	0.0129
69	1.9113	6800.594	0.3325	145.30	0.0122
70	1.9395	6900.932	0.3408	146.65	0.0135
71	1.9674	7000.203	0.3484	147.89	0.0125
72	1.9955	7100.186	0.3557	149.08	0.0119
73	2.0236	7200.168	0.3626	150.20	0.0112
74	2.0518	7300.507	0.3715	151.65	0.0145
75	2.0800	7400.845	0.3791	152.89	0.0123
76	2.1080	7500.472	0.3858	153.99	0.0110

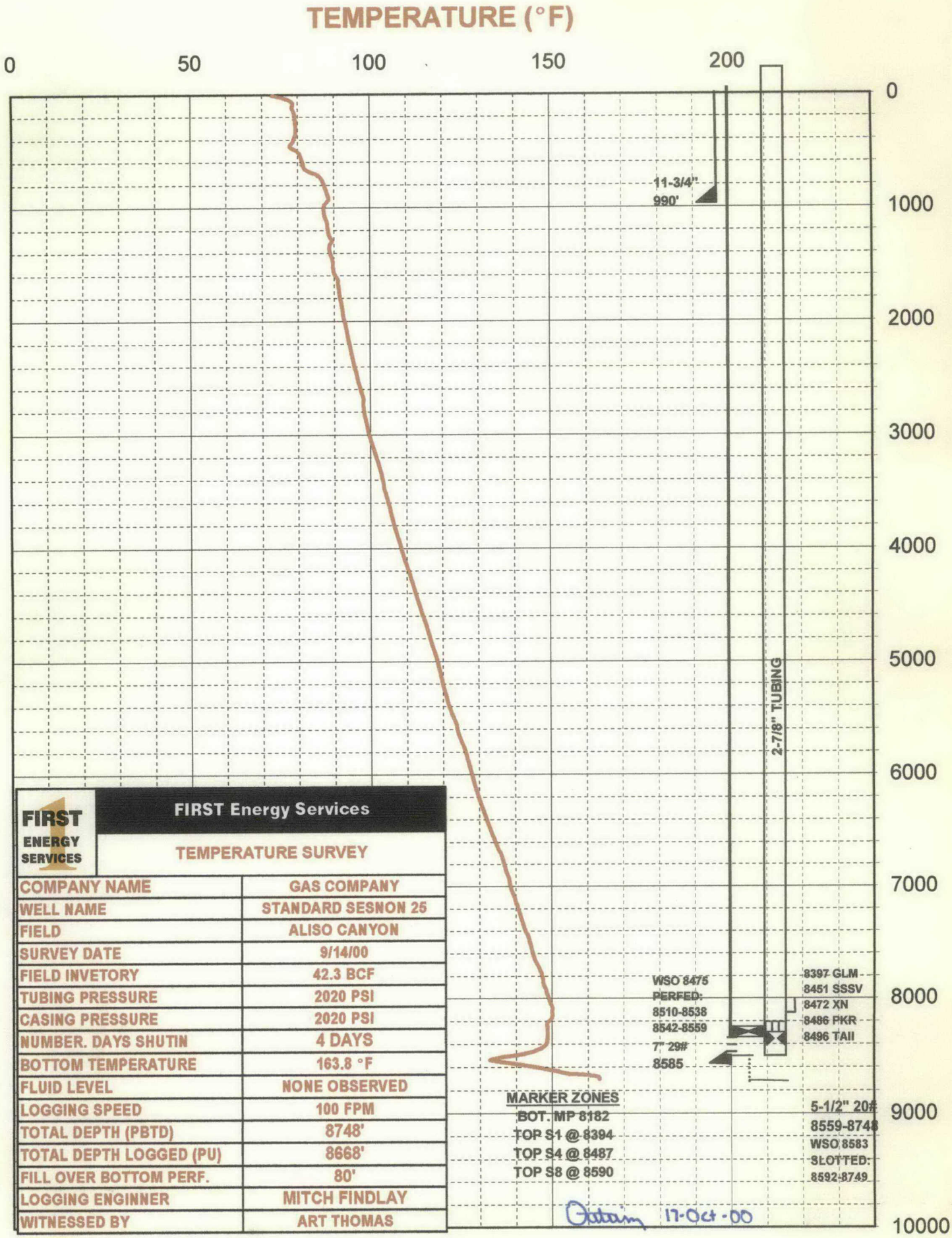
****
* The Gas Company *
****

Company ..: SO. CAL. GAS
Well I.D..: SS-25
Field I.D.: ALISO CYN.

Date: 10/19/95
Run#: 1
Page: 3

NO.	DEPTH DEFL(IN)	DEPTH FEET	TEMPERATURE DEFL(IN)	TEMPERATURE F	GRADIENT
77	2.1361	7600.454	0.3934	155.22	0.0124
78	2.1643	7700.793	0.4013	156.48	0.0125
79	2.1923	7800.419	0.4111	157.84	0.0137
80	2.2205	7900.758	0.4190	158.94	0.0109
81	2.2484	8000.029	0.4285	160.26	0.0133
82	2.2765	8100.011	0.4366	161.39	0.0113
83	2.3048	8200.705	0.4409	161.99	0.0059
84	2.3328	8300.332	0.4396	161.80	-0.0018
85	2.3373	8316.344	0.4380	161.58	-0.0139
86	2.3510	8365.090	0.4257	159.87	-0.0351
87	2.3609	8400.314	0.3996	156.23	-0.1033
88	2.3692	8429.847	0.3874	154.25	-0.0673
89	2.3891	8500.653	0.4044	156.91	0.0376
90	2.4172	8600.636	0.4506	163.33	0.0642
91	2.4381	8675.000	0.4781	167.16	0.0514

***** end data *****



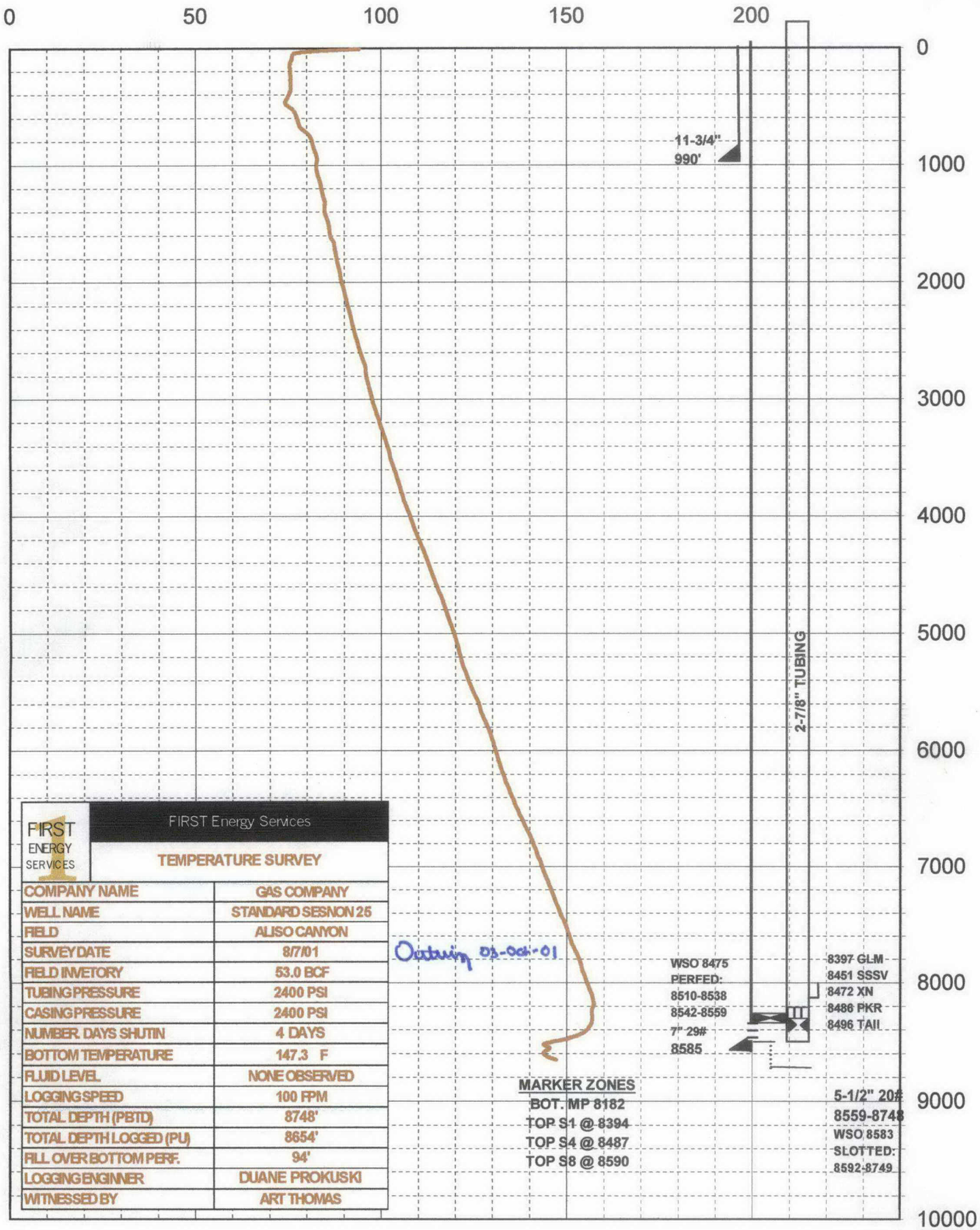
FIRST ENERGY SERVICES

FIRST Energy Services

TEMPERATURE SURVEY

COMPANY NAME	GAS COMPANY
WELL NAME	STANDARD SESNON 25
FIELD	ALISO CANYON
SURVEY DATE	9/14/00
FIELD INVETORY	42.3 BCF
TUBING PRESSURE	2020 PSI
CASING PRESSURE	2020 PSI
NUMBER. DAYS SHUTIN	4 DAYS
BOTTOM TEMPERATURE	163.8 °F
FLUID LEVEL	NONE OBSERVED
LOGGING SPEED	100 FPM
TOTAL DEPTH (PBTD)	8748'
TOTAL DEPTH LOGGED (PU)	8668'
FILL OVER BOTTOM PERF.	80'
LOGGING ENGINNER	MITCH FINDLAY
WITNESSED BY	ART THOMAS

TEMPERATURE (F)

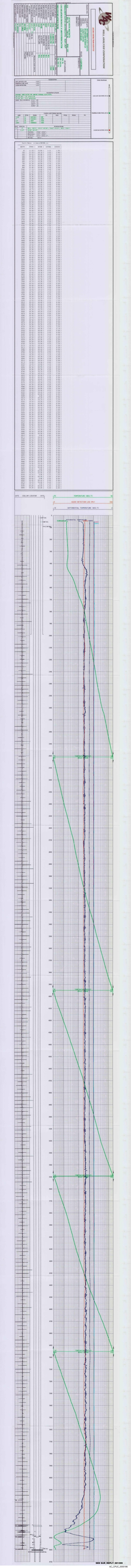


FIRST ENERGY SERVICES

FIRST Energy Services

TEMPERATURE SURVEY

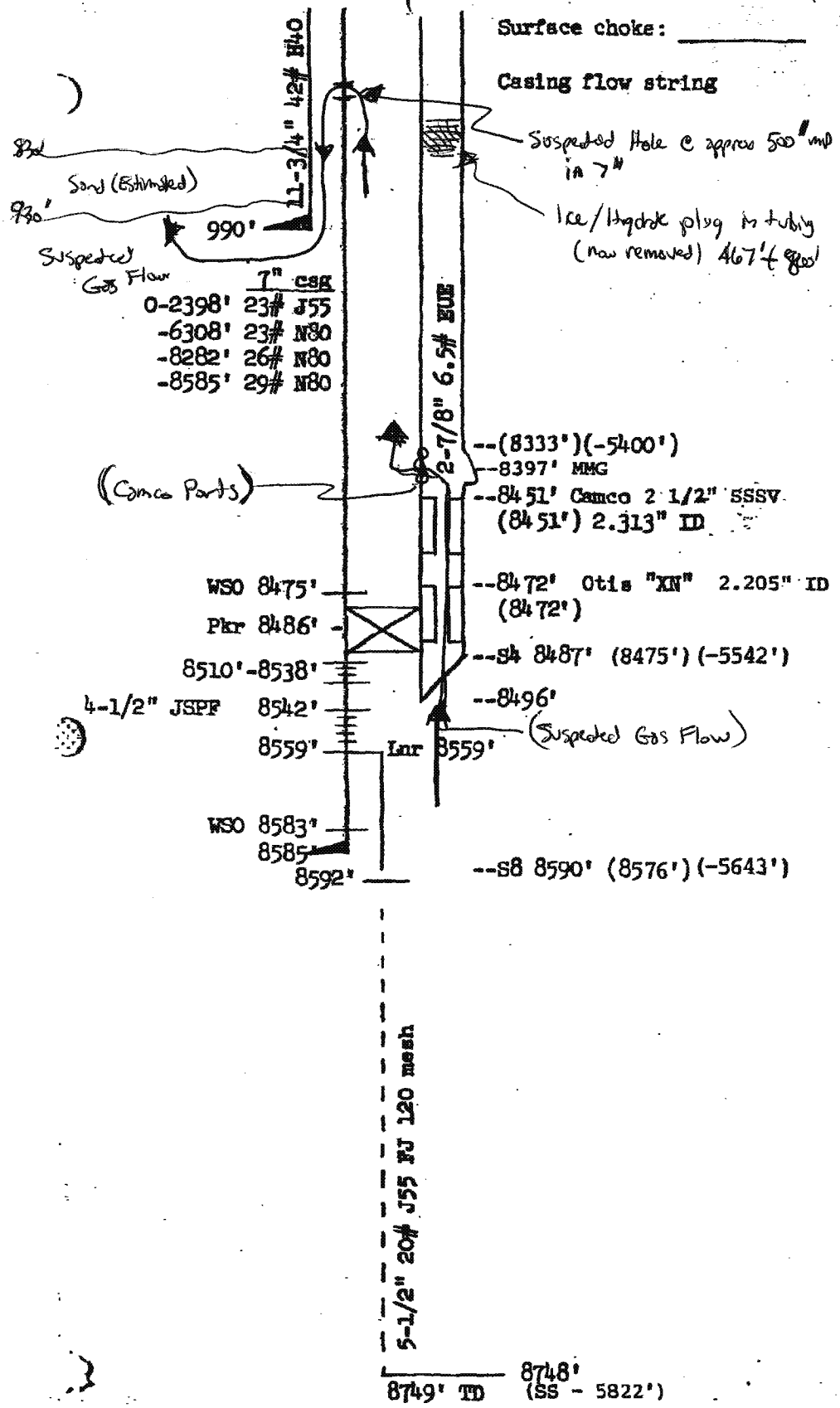
COMPANY NAME	GAS COMPANY
WELL NAME	STANDARD SESNON 25
FIELD	ALISO CANYON
SURVEY DATE	8/7/01
FIELD INVETORY	53.0 BCF
TUBING PRESSURE	2400 PSI
CASING PRESSURE	2400 PSI
NUMBER. DAYS SHUTIN	4 DAYS
BOTTOM TEMPERATURE	147.3 F
FLUID LEVEL	NONE OBSERVED
LOGGING SPEED	100 FPM
TOTAL DEPTH (PBTD)	8748'
TOTAL DEPTH LOGGED (PU)	8654'
FILL OVER BOTTOM PERF.	94'
LOGGING ENGINNER	DUANE PROKUSKI
WITNESSED BY	ART THOMAS


SEB SUR REPLY 201200
SEB SUR REPLY 201200

ESTIMATED WELL CONDITIONS (As of 11-10-15)

Elevation: 2927" G.L.
DF: 6'

Standard Sesnon 25



10/1/53 - Well spud
2/25/54 - Well completed 893' of 4-1/2" drill pipe + Johnston tester side tracked - old TD 4948' plugged back 3860'
5/24/73 - 6/6/73 Cleaned out to 8748', pressure tested csg, perforated for conversion to gas storage, ran tbg with gas lift valves
6/25/76 - 7/9/76 Cleaned out to 8748', ran tbg with SSSV
2/16/79-2/20/79 Replaced safety system

NOTE: Unable to use lower nipple - use M-lock for SSSV nipple. See wire-line tickets.

WELL VOLUME

	Cu.Ft.	Bbl.
Tubing	276	49
Csg/Lnr.	37	7
Annulus	1469	262

6-16-86

SED SUR_REPLY_001400

AC_CPUC_SED_DR_17_0046340

CHAPTER 3
EXHIBITS

General Procedure

Washing Through Gas Hydrates

November 3, 2015

1. Rig up coiled tubing equipment.
2. Test all equipment.
3. Displace glycol to cross above master valve.
4. Attempt to displace glycol to 467 ft.
5. If unable to displace glycol wash through suspected hydrate plug in tubing.
6. Begin circulating with 10.8 ppg $CaCl_2$ at 1.0 bpm.
7. Adjust choke to maintain 2,700 to 3,000 psi back pressure.
8. Record pump pressure.
9. Set kick out on pump to 500 psi above recorded pump pressure.
10. Begin washing down at 10 to 15 ft/min pumping 10.8 ppg $CaCl_2$. (The rate in will be dictated by the ability to wash through any hydrates).
11. Maintain 2,700 to 3,000 psi back pressure with choke. Adjust choke accordingly watching for choke plugging off with hydrates.
12. Work pipe to ensure coiled tubing does not become stuck.
13. Continue washing in the hole to the end of tubing pumping 10.8 ppg $CaCl_2$.

Kill Procedure

SS-25

Nov. 12, 2015

1. Ensure a minimum of 600 bbls of 9.4 ppg $CaCl_2$ is available to pump before perforating the tubing.
2. Make up 2-7/8" EZSV on e-line.
3. Stab lubricator. Test to 300/4,000 psi.
4. RIH with 2-7/8" EZSV.
5. Set EZSV at ± 8,390 ft.
6. Pull out of hole.
7. Perform positive test on EZSV to 500 psi above tubing pressure.
8. Observe 30 minutes.
9. Perform negative test on EZSV to 500 psi below tubing pressure.
10. Observe for 30 minutes.
11. RIH with tubing punch.
12. Pressure tubing to 2,000 psi.
13. Perforate tubing ± 8,391 – 8,385 ft. (16 Shots, 0.3" x 3/8" Charge, 4 shots/foot)
14. Pull out of hole into lubricator.
15. Close swab valve and upper maseter.
16. Pump 10 bbls 9.4 ppg Polymer Plug.
17. Start pumping 9.4 ppg $CaCl_2$ at 4 bpm. Observe pressures
18. Increase pump rate according to pump pressure. MAX PUMP PRESSURE – 4,000 psi.
    - Observe pump pressure when KWM leaves the perforations. Attempt to maintain constant pump pressure.
    - If unable to maintain constant pump pressure a decision will be made to open choke to allow KWM to flow up the 2-7/8" x 7" annulus.
19. Pump 303 bbls. Observe well.

Barite Pill
November 14, 2015

1. Mix 22 bbls of 18.0 ppg barite pill in batch mixer.

BARITE PLUG – WATER BASED SLURRY – 1 BARREL					
Slurry wt, ppg	**14.0**	**16.0**	**18.0**	**20.0**	**22.0**
Fresh Water, % bbl	.788	.713	.638	.563	.489
BAROID, ppb	310	420	530	641	750
QUICK-THIN, ppb	2	2	2	2	2
Caustic Soda, ppb	.5	.5	.5	.5	.5

2. Pump 50 bbls of 9.4 ppg $CaCl_2$ to ensure perforations are open.
3. Continue pumping170 bbls 9.4 ppg $CaCl_2$ at 8- 10 bpm.
4. Displace 22 bbls of 18.0 ppg barite pill.
5. Displace barite pill with 50 bbls of 9.4 $CaCl_2$ at 4 bpm
6. Shut down.
7. Wait on barite pill for 12 hours.

Barite Pill
November 14, 2015

1. Mix 22 bbls of 18.0 ppg barite pill in batch mixer.

BARITE PLUG – WATER BASED SLURRY – 1 BARREL					
Slurry wt, ppg	**14.0**	**16.0**	**18.0**	**20.0**	**22.0**
Fresh Water, % bbl	.788	.713	.638	.563	.489
BAROID, ppb	310	420	530	641	750
QUICK-THIN, ppb	2	2	2	2	2
Caustic Soda, ppb	.5	.5	.5	.5	.5

2. Pump 50 bbls of 9.4 ppg $CaCl_2$ to ensure perforations are open.
3. Continue pumping170 bbls 9.4 ppg $CaCl_2$ at 8- 10 bpm.
4. Displace 22 bbls of 18.0 ppg barite pill.
5. Displace barite pill with 50 bbls of 9.4 $CaCl_2$ at 4 bpm
6. Shut down.
7. Wait on barite pill for 12 hours.

Barite Pill
November 15, 2015

1. Pump 50 bbls 9.4 $CaCl_2$ down tubing to ensure perforations are open.
2. Mix 35 bbls of 18.0 ppg barite pill in batch mixer.

BARITE PLUG – WATER BASED SLURRY – 1 BARREL					
Slurry wt, ppg	**14.0**	**16.0**	**18.0**	**20.0**	**22.0**
Fresh Water, % bbl	.788	.713	.638	.563	.489
BAROID, ppb	310	420	530	641	750
QUICK-THIN, ppb	2	2	2	2	2
Caustic Soda, ppb	.5	.5	.5	.5	.5

Fresh Water	22.3 bbls	
Barite	18,550 lbs	(185.5 sacks)
Thinner	70 lbs	
Caustic	17.5 lbs	

3. Begin pumping 9.4 ppg $CaCl_2$ at 8 - 10 bpm.
4. Pump 170 bbls $CaCl_2$ at 8 – 10 bpm.
5. Pump 35 bbls of 18.0 ppg barite pill down the tubing.
6. Begin displacing barite pill with 9.4 ppg $CaCl_2$ at 8 bpm.
7. After 13 bbls displaced slow pump rate to 6 bpm.
8. After 30 bbls displacement slow pump rate to 4 bpm.
9. After 40 bbls displaced slow pump rate to 2 bpm.
10. After 45 bbls displaced slow pump rate to 1 bpm.
11. After 50 bbls displaced shut down.
12. Wait on barite pill for 12 hours.
13. Monitor Pressures.

Contingencies

A. 125 bbls of 9.4 ppg $CaCl_2$ + 22 bbls of 18.0 ppg Barite Pill in the 7” x 2-7/8” annulus equates to 2,700 psi hydrostatic pressure.
B. If transfer pump goes down while transferring the barite pill to the pump truck immediately displace any pill in the tubing out of the perforations with 9.4 ppg $CaCl_2$.

C. The barite pill can be pumped at any time. If surface conditions deteriorate a decision will be made to pump the barite pill even if 170 bbls of 9.4 ppg $CaCl_2$ has not been pumped.

Barite Pill
November 15, 2015

1. Mix 22 bbls of 18.0 ppg barite pill in batch mixer.

BARITE PLUG – WATER BASED SLURRY – 1 BARREL					
Slurry wt, ppg	**14.0**	**16.0**	**18.0**	**20.0**	**22.0**
Fresh Water, % bbl	.788	.713	.638	.563	.489
BAROID, ppb	310	420	530	641	750
QUICK-THIN, ppb	2	2	2	2	2
Caustic Soda, ppb	.5	.5	.5	.5	.5

2. Pump 50 bbls of 9.4 ppg $CaCl_2$ to ensure perforations are open.
3. Continue pumping170 bbls (220 bbls total) 9.4 ppg $CaCl_2$ at 8 - 10 bpm.
4. Displace 22 bbls of 18.0 ppg barite pill.
5. Displace barite pill with 50 bbls of 9.4 $CaCl_2$ at 4 bpm
6. Shut down.
7. Wait on barite pill for 12 hours.
8. Monitor Pressures.

Contingencies

A. 125 bbls of 9.4 ppg $CaCl_2$ + 22 bbls of 18.0 ppg Barite Pill in the 7" x 2-7/8" annulus equates to 2,700 psi hydrostatic pressure.

B. If transfer pump goes down while transferring the barite pill to the pump truck immediately displace any pill in the tubing out of the perforations with 9.4 ppg $CaCl_2$.

C. The barite pill can be pumped at anytime. If surface conditions deteriorate a decision will be made to pump the barite pill even if 170 bbls of 9.4 ppg $CaCl_2$ has not been pumped.

WELL 25

Kill Program

11-24-15

1. Mix 50 bbl GEO Zan pill in 9.4 ppg $CaCl_2$
2. Mix 35 bbl 18.0 ppg Barite Pill.
3. Pump 50 bbls GEO Zan pill down tubing.
   - Prepare 50 bbls GEO Zan pill in 9.4 ppg $CaCl_2$.
4. Begin pumping fresh water at 12-15 bpm.
   - Monitor pump pressures. Pump at highest rate possible keeping pump pressure below 5,000 psi.
5. Pump 1,000 bbls of fresh water at 11-15 bpm.
6. Observe well.
7. If well is dead continue with **STEP 9.**
8. If well is not dead continue with **STEP 12.**
9. Pump 35 bbl 18.0 ppg Barite Pill down tubing.
10. Displace out of the perforations. (Estimated Displacement Volume – 55.5 bbls.)
11. If well is not dead begin pumping 9.4 ppg $CaCl_2$ at 8 – 10 BPM. Pump LCM pills as needed.
    - Monitor pump pressures. Pump at highest rate possible keeping pump pressure below 5,000 psi.
12. Pump 500 bbls CaCl2 at 8-10 bpm.
    - Monitor pump pressures. Pump at highest rate possible keeping pump pressure below 5,000 psi.
13. Pump 35 bbls 18.0 ppg barite pill down tubing.
14. Displace with 56 bbls $CaCl_2$

Contingencies

A. If while pumping unable to build pump pressure pump 15 bbl Polymer "sweeps".
B. Slow pump rates to try and build pump pressure.
C. If surface conditions deteriorate the barite pill can be pumped at any time.
D. Have transport trucks loaded with $CaCl_2$ to fill frac tank once pumping operations commence.
E. Have transport truck loaded with fresh water once pumping operations commence.

WELL 25

Kill Program

11-25-15

1. Mix 100 bbl GEO Zan pill with LCM in 9.4 ppg $CaCl_2$
2. Pump 50 bbls GEO Zan pill down tubing.
   - Prepare 50 bbls GEO Zan pill in 9.4 ppg $CaCl_2$.
3. Begin pumping fresh water down tubing at 12-15 bpm.
   - Monitor pump pressures. Pump at highest rate possible keeping pump pressure below 5,000 psi.
4. Pump a minimum 1,000 bbls of fresh water at 12-15 bpm.
5. Bleed off 7" casing.
6. Once 7" casing bleeds off pump 100 bbls GEO Zan pill down tubing.
7. Displace place GEO Zan pill will 56 bbls of 9.4 $CaCl_s$
8. Displace out of the perforations. (Estimated Displacement Volume – 56 bbls.)
9. Line up to pump down 7" casing.
10. Pump "Junk Shot" down 7" casing.
11. Fill 7" casing with fresh water.
12. Observe well.

BOOTS & COOTS
A HALLIBURTON SERVICE
7047 W. Greens Road
Houston, Texas 77066
281-931-8884

PROJECT MEMO

Date:	12- 12- 2015	**Well Name and Number:**	Standard Senson 25
Company Name:	SOCAL Gas Company		Los Angeles
Company Billing Address:		**State:**	California
		Country:	USA
Client AFE #:		**Well Location:**	Aliso Canyon Storage Facility
Client Representative:	Bret Lane	**Well Type:**	Gas Storage
Report Generated By:	R. Gomez	**Field:**	

BACKGROUND

Background

The Southern California Gas Company Standard Sesnon 25 Well sustained a surface blowout resulting in broaches and fissures at the surface. Intervention operations have consisted of high volume high rate kills and have proved to be ineffective as the well continues to flow uncontrolled at surface. The main reason the well cannot be killed is that the well cannot sustain a column of fluid that will hydrostatically control the well.

The following procedure is designed to breakdown the production reservoir in order to pump a matting material to effect a seal and provide a base on which to seal off the porosity of the producing zone.

Operations will consist of pumping 60 bbls of 15.0 ppg water based mud followed with a "junk shot" followed with a 100 bbl 15.0 ppg Diaseal M pill (diatomaceous earth) and 300 bbls of 15.0 ppg WBM.

Location Preparation

To reduce further erosion of the broach adjacent to the well, Boots & Coots personnel will line the inside of the broach with large diameter (6" – 10") river rock. Additionally, a pump out line will be available so that any produced fluids may be siphoned off at the conclusion of pumping operations.

B & C will remove any surface equipment and concrete barriers that will interfere with spotting mud tanks, pump trucks and blenders.

Tubing Severance

Run in the hole with a gauge ring to the deepest depth possible, pickup a radial cutting torch on slickline to the maximum depth and cut the tubing above the perforations. Make a second cut 10 ft. above the original cut to insure that there are no obstructions.

Commence pumping operations with 60 bbls of 15.0 ppg WBM and pump down the tubing at a rate of 2.0 - 4.0 bpm with a maximum pressure of 4,000 psi. Follow immediately with a junk shot consisting of rope, cut rubber, .5 " steel balls, nut plug, kwik seal (medium).

Diaseal-M Mixing Procedure

The proposed procedure is for mixing a 15.0 ppg 100 bbl Diaseal M Squeeze with LCM added to it. **Note: The LCM should be limited to the use of walnut hulls.** The Diaseal M squeeze should be mixed using a hopper and ribbon blender. Ideally, the 100 bbl pill will require 90 bbls fresh water, 125 sacks of Diaseal M and 90 sacks of barite to achieve the 15.0 ppg. Add an equivalent of 30 ppb walnut plug.

Diaseal-M Pumping

After mixing the Diaseal M pump the slurry down the tubing at a rate of 2 - 4 bpm, displace Diaseal M with 300 bbls of 15.0 ppg WBM at the same rate.

Shut down pumping operations and monitor well for 12 hours. Prepare to repeat the procedure up to 4 times.

Materials List

1- Hopper
2- 100 bbl ribbon blender
3- Mud tanks w/ agitation
4- 600 sacks Diaseal M
5- 1500 bbls 15.0 ppg WBM
6- 30 .5" steel balls
7- 30 sacks Kwik Seal (medium)

BARITE PLUG (WBM) RECOMMENDED OPTION

Barite plugs are utilized in well control operations primarily for the purpose of sealing formations that are flowing into the wellbore. The desired result of the plug is to have the weighting material settle rapidly and evenly. In most applications, the required weighting material will be barite with some cases requiring hematite. Combinations of both weighting materials may also be used. Either material can be mixed in water based fluids.

The optimum range for weighting up with barite is from 14.0 ppg to 16.0 ppg although slurries may be weighted up to 22.0 ppg using barite. The optimum range for using hematite is from 16.0 ppg to 18.0 ppg with higher weights achieved through additions of galena.

Factors that affect settling rates include contaminants, density; make up water, gel strengths and viscosity. The heavier the plug the slower the settling rate will be because of a higher solids content resulting in higher gel strengths and viscosities. The higher the concentration of contaminants, the higher the viscosity resulting in slower settling times.

Increased settling times can be achieved in water based muds by pre-treatment of the makeup water with Sodium Acid Pyrophosphate (SAPP) to precipitate out any calcium. It is highly recommended to use either SAPP or Desco® (thinner) to reduce further chemical flocculation.

A general rule of thumb is to mix the barite plug to approximately 2.0 ppg above the mud weight in use at the time.

The barite slurry may be pumped through the drillpipe through a cementing head or through the standpipe and kelly. In either case, the pump tie-in to the drillpipe should contain provisions for hooking up both the cementing pump and the rig pump so that either can be used to displace the slurry. If this is not done, and the cementing unit breaks down, the barite may settle in the drillpipe before the mud pump tie-in can be made or the cementing unit repaired. Blockage of the drillstring by barite settling will complicate the well control problem.

Field Mixing of Barite Plugs

1. Determine the number of barrels of plug you want to set.
2. Determine the amount of water needed. This will be about 50% of the total volume for a 14.5 ppg barite plug.
3. Put half of the number of barrels of water required in the pit. For example, for 50 bbl plug, you would need about 25-26 bbls of water total. Put 12-13 bbls in the pit.
4. Empty and clean the slugging pit.
5. Put just enough mixing water in the pit to obtain a suction with the mixing system
6. Add one 50 lb of SAAP (Sodium Acid Pyrophosphate) into the mixing water, agitate for approximately 10 minutes.
7. Begin adding weight material until desired weight is obtained. The pill should become viscous. The idea is to get as much barite into the fluid as possible without it starting to fall out or making the fluid unworkable. Continue agitation.
8. Trickle in the remaining water and barite until the final volume is built.

There are a few recommendations regarding setting of the plug that you should consider.

- Run a pilot test with the plug to determine the settling time. Measure the settled volume in a vis cup at several different time intervals. Measure the settled volume of the barite when it has all fallen out. This can be useful in determining the actual settled volume vs. the calculated settled volume.
- Spacers before and behind the plug may cause them to settle out in the drill string.
- Pump the plug with the cementing unit.
- Displace the plug with the cementing unit.
- Have both the rig pumps and the cementing unit lined up to pump. If one pump goes down, be able to quickly switch to the other pump.
- Over displace the plug out of the drill string by 5 bbls.
- Pump $^1/_2$-1 barrel or so every 15 minutes or so to ensure that the drill string remains clear.

- Pump plug and chase with mud. **DO NOT CHASE THE PLUG WITH WATER.**
- Pump the plug at a high enough rate to ensure that there is pressure on the drill string. Don't let the drill string go on a vacuum, if possible. Monitor the drill pipe pressure carefully while pumping in case the plug shows signs of settling out while pumping.
- Wait on the plug after setting a minimum of 8 hours, check surface sample. If necessary wait up to 12 hours.

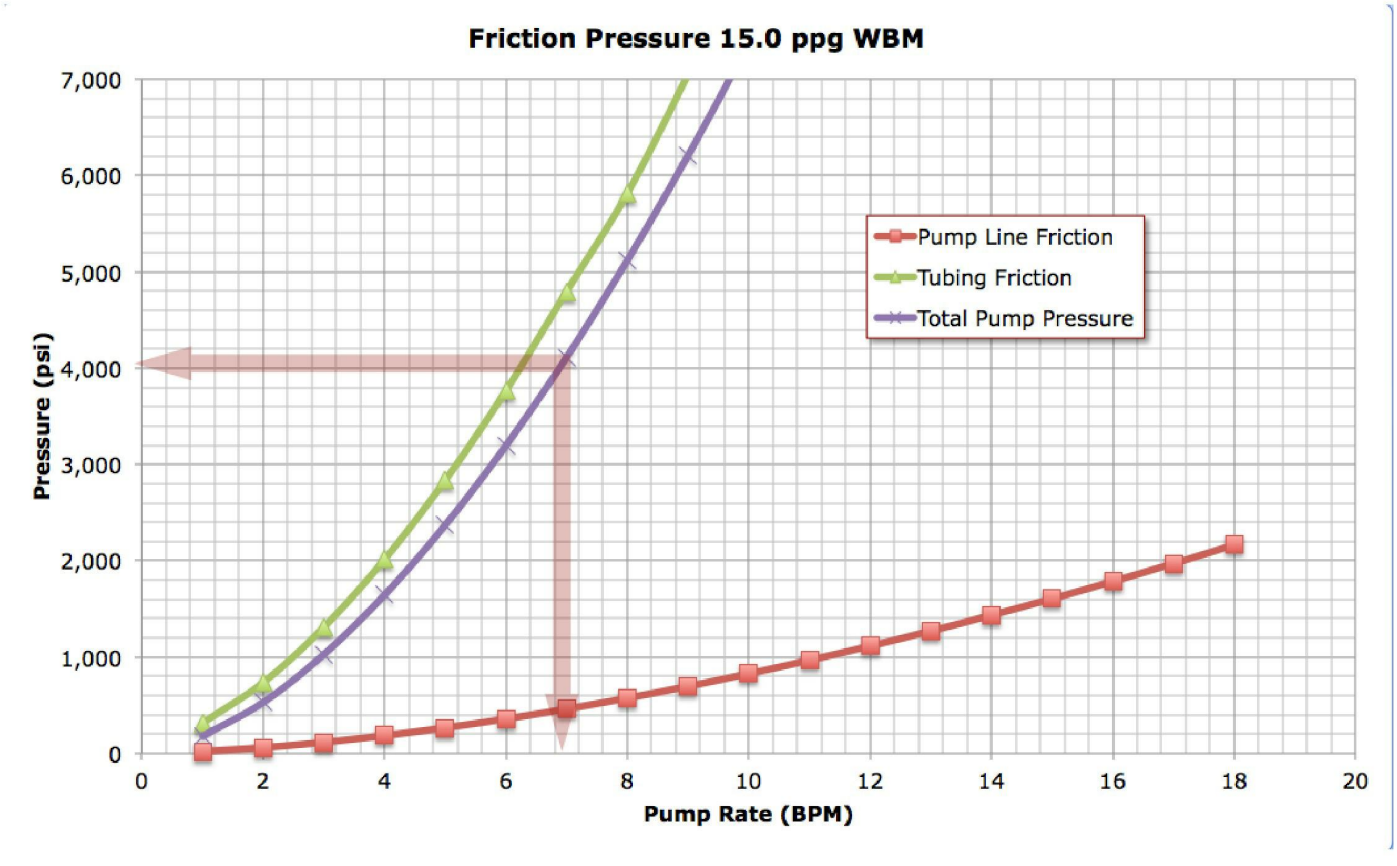
Table #1 - Make-up of water and barite supply

Slurry wt	Sx. Barite/Bbl.	Gal. Water/Bbl.
14 Lb/gal	3.1 sx.	33.2 Gals
15	3.7	31.7
16	4.2	30.1
17	4.8	28.6
18	5.3	27.0
19	5.9	25.5
20	6.4	23.9
21	7.0	22.4

This procedure would require setting a mag range plug at the bottom of the drillpipe at 5,952 feetjust above the BHA

Barite Pill Preparation

1. 4 sacks SAPP or 4 sacks Desco
2. 400 sacks barite
3. 200 bbls water



Sodium Silicate Procedure

1. Designate one pump truck to pump fresh water and sodium silicate pill and one pump truck to pump $CaCl_2$. **($CaCl_2$ and Sodium Silicate CANNONT come in contact with each other in pumps, transfer hoses, or pump line.)**
2. Clean batch mixer tanks with fresh water and flush transfer hoses with fresh water to remove any $CaCl_2$
3. Fill Batch mixer tank with 30 bbls fresh water.
4. Clean displacement tanks and flush pump lines with fresh water to remove any $CaCl_2$.
5. Pump 318 bbls 9.4 ppg $CaCl_2$ with pump designated for $CaCl_2$ at highest rate possible keeping pump pressure below 5,000 psi.
6. Displace 6 bbls of fresh water from batch mixer tank with pump truck designated for water and sodium silicate.
7. Pump 15 bbls Sodium Silicate with pump.
8. Pump 6 bbls of fresh water from batch mixer.
9. Displace with 56 bbls $CaCl_2$.

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED OCTOBER 23, 2018

SOCALGAS RESPONSE DATED DECEMBER 6, 2018

SoCalGas provides the following Responses to the CPUC-Safety and Enforcement Division's (CPUC-SED) data request dated October 23, 2018 related to the preliminary investigation regarding the Aliso Canyon Well Leak. CPUC-SED initially requested that Responses be provided by November 7, 2018. SoCalGas requested and CPUC-SED granted, an extension of the due date until December 7, 2018. On December 4, 2018, CPUC-SED asked whether SoCalGas could provide its Responses earlier than December 7, 2018. In accordance with CPUC-SED's request, SoCalGas is submitting its Responses on December 6, 2018. The Responses are based upon the best available, non-privileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding before any court, action. Finally, at the time of this Response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

For this set of questions, please refer to the following timeline, which is a verbatim copy of what SED received from Southern California Gas Company (SoCalGas) in response to a question 1 of an SED Data Request to SoCalGas, dated November 13, 2015. For reference, a copy of the SED Data Request dated November 13, 2015 is Appendix A at the bottom of this data request. Questions are shown below this timeline stated from SoCalGas.

Aliso Canyon Natural Gas Leak November 15, 2015

DRAFT Timeline of Events*

- Friday, October 23 – Leak discovered, area made safe for well procedures, personnel and equipment mobilized; standard procedures began, internal notifications made.
- Saturday, October 24 – Standard procedures to stop leak not effective. SoCalGas brings in additional external expertise (Onyx & Halliburton). Regulatory notifications begin.
- Sunday, October 25 –Boots and Coots experts arrive, mobilize and begin evaluation. SoCalGas Media & Employee Communications team participating. Initial information regarding situation distributed to Customer Contact Center and others that night. Regulatory notifications expanded.
- Monday, October 26 – SoCalGas' Emergency Operations Center (EOC) activated in monitor mode to provide support to Aliso Canyon Incident Command team. Evaluations continue on the well. Customer message posted on socalgas.com. SoCalGas holds community meeting on Aliso Canyon Turbine Replacement Project. Provided information and answers about leak. Some customers expressed anger/frustration about the leak.

- Tuesday, October 27 – Crews conduct more diagnostics and tests. Letter sent to customers, posted, emailed to elected officials, HOAs. SoCalGas sets up dedicated email and phone hotline for customer inquiries. Daily operational briefing set up for fire dept., emergency management and elected official Public Information Officers (PIO). Daily briefings with SCAQMD begin.
- Wednesday, October 28 – Crews use wireline rig for diagnostics. KTLA-TV Channel 5 and KABC-TV Channel 7 cover story. Customer letter hand delivered to 1,400 homes. Public information booth set up at Aliso Canyon facility and staffed from 10 a.m. and 5 p.m. daily.
- Thursday, October 29 – Multiple diagnostics, including initial "wireline" completed. Determined need for coiled tubing rig to be brought in. SoCalGas mails 8,100 letters to Porter Ranch area. SoCalGas creates Frequently Asked Questions fact sheet to help respond to customer questions.
- Friday, October 30 – Wireline equipment removed. Update letter, fact sheet emailed with message that odor will last. SoCalGas begins daily air sampling of multiple random sites on site and in community which is available on socalgas.com. KTLA-TV Channel 5 and KABC-TV Channel 7 cover protest at Aliso Canyon gates by local activists. Less than 20 attend rally. L.A. Daily News runs story and photos: "Natural Gas Leak Near Porter Ranch Lingers Nearly One Week Later."
- Saturday, October 31--Crews at SoCalGas work to prepare site for coiled tubing rig. SoCalGas delivers an update via letter to 1,400 homes closest to the facility.
- Sunday, November 1—Coiled tubing rig arrives in late afternoon. Adjacent wells killed (one Saturday & one Sunday) in preparation for work on SS-25.
- Monday, November 2 – Equipment unloaded, set up. SoCalGas mails letter to 8,100 customers. SoCalGas.com begins daily posting of updates; Posted air sampling results on socalgas.com.
- Tuesday, November 3 – Coiled tubing ready set up and connected, started pressure testing.
- Wednesday, November 4 – Coiled tubing pressure testing continues. SoCalGas briefs representatives from L.A. City and County Fire Departments, Hazmat, SCAQMD, DOGGR, L.A. County Department of Health and elected officials prior to the Porter Ranch Neighborhood Council meeting. SoCalGas speaks at the Porter Ranch Neighborhood Council. KTLA-TV Channel 5 and KCBS-TV Channel 2, KNX 1070 radio cover. Ken Bruno from CPUC SED visits with Jimmie Cho, SoCalGas Senior Vice President - Gas Operations and System Integrity, for tour of site. L.A. Daily News runs story: "Leaking Natural Gas Well Concerns Porter Ranch Residents."
- Thursday, Nov 5. – Coiled tubing pressure testing completed. L.A. Daily News reports on community meeting. Reporter Greg Wilcox visits Aliso Canyon main office area and interviews Jimmie Cho and Glenn La Fevers, SoCalGas' Storage Operations Manager. SoCalGas supplies photos to press. L.A. Daily News updates story: "Porter Ranch Residents Confront Officials Over Gas Leak."
- Friday, Nov. 6 – Coiled tubing rig begins breaking through the blockage and introducing fluid into the well. SoCalGas adds daily p.m. email briefing to local PIOs and elected officials.
- Saturday, Nov 7 - Second day of multi-day coiled tubing operation focuses on additional evaluation to guide the next step efforts to stop the flow of gas. Wireline rig set up. SoCalGas continues air monitoring. CARB/CEC fly plane over site to monitor methane. L.A. Daily News online article "New Attempt Made to Stop Gas Leak" featured on home page, reports on situation and includes photos coiled tubing rig and of SoCalGas execs meeting with LAFD officials on site. Posted on front page of weekend edition.

- Sunday Nov. 8 – Well-management experts continue multi-day evaluation. The focus was on continued evaluation of the well pipe conditions. Information from multiple diagnostic tests will guide next steps to safely stop the flow of gas. L.A. Daily News runs column: "Leaking Well a Vexing Problem."
- Monday November 9 – Well-management experts continue multi-day evaluation. L.A. Daily News runs column: "Crews Make Progress in Repairing Gas Leak."
- November 10 - Additional well testing work performed. Hosted a site visit by representatives from state and local agencies and elected offices. Visitors were provided an overview of Aliso Canyon and Storage operations, and briefed on the current status of efforts to mitigate the leaking well.
- November 11 - Conducted data analysis, finalized strategy to stop the leak, and began preparing the site with the appropriate well-control equipment.
- November 12 - Successfully installed the "bridge plug" in the well tubing and continued to prepare the well site.
- November 13 - Tubing perforation activities performed and attempted stop the flow of gas by putting fluids down the well. During this operation, there was a release of a mist into the air. Based on the information at this time, it is not believed that these materials pose a threat to public health. Out of an abundance of caution, residents were notified to stay inside. Once determined that the mist was contained to our facility, residents were again notified that there was no reason to remain inside. Office of Emergency Services and National Response Center were notified of the release. They were updated at 3:14 pm that flow was reduced.
- November 14 – Evaluating the well conditions, preparing the site and determining the best strategy for our continued efforts to stop the flow of gas. Representatives from the L.A. County Health & Hazmat have inspected the site today and yesterday and observed our containment procedures. Collected samples of the mud and liquid from yesterday's release and having it analyzed and expect results tonight. At 1:05 pm OES and NRC were notified of release containment and minor additional release of crude oil at 4:30 am.

* Based on best available information at this time.

<u>Question 1</u>:

With regards to the statement: "Saturday, October 24 – Standard procedures to stop leak not effective. SoCalGas brings in additional external expertise (Onyx & Halliburton). Regulatory notifications begin."

a. Please identify and provide which procedures SoCalGas is referring to in this statement.
b. Please specify the page numbers and quote the words of each procedure that SoCalGas says were "not effective".
c. Please explain why SoCalGas states that these procedures were not effective.
d. Once SoCalGas determined that these procedures were not effective, did SoCalGas attempt to follow other non-standard procedures?
e. If the answer to question 1d is yes, which ones?
f. If the answer to question 1d is yes, explain why SoCalGas attempted to follow the non-standard procedures it did?
g. If the answer to question 1d is no, why did SoCalGas not follow other non-standard

procedures?

h. Identify all personnel from Onyx brought in as additional external expertise.
i. Provide the resumes showing backgrounds of each personnel member from Onyx.
j. Explain the role of each member of Onyx who SoCalGas brought in for additional external expertise.
k. Provide the contract or contracts with Onyx for bringing in their additional external expertise.
l. Provide the invoices from Onyx to provide their additional external expertise.
m. What steps did SoCalGas take in following these procedures?
n. At what point did SoCalGas learn that their standard procedures to stop the leak were ineffective? How did SoCalGas tell that the procedures were ineffective?
o. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 1:

a. The procedures performed on the October 24, 2015 included the wellhead seal repair operation followed by the well kill attempt down the tubing and casing. SoCalGas operators performed the first top kill operation by pumping polymer solution into the 2 7/8" tubing. The tubing pressure increased rapidly, indicating the presence of a blockage in the tubing. Next, 89 barrels of brine were pumped into the casing annular space in a further attempt to kill the well.
b. SoCalGas objects to this request to the degree that it assumes "Standard procedure" is referring to a written formal SoCalGas procedure. Notwithstanding this objection, SoCalGas responds as follows: See Response 1.a.
c. See Response 1.a. They were not effective because gas continued leaking from the well after the actions were taken.
d. SoCalGas objects to this request on the ground that it is vague and ambiguous as to the term "non-standard." Notwithstanding this objection, SoCalGas responds as follows: See Response 1.a.
e. See Response 1.d.
f. See Response 1.d.
g. See Response 1.d.
h. Please see electronic documents with Bates range AC_CPUC_SED_DR_33_0000001 - AC_CPUC_SED_DR_33_0000002.
i. SoCalGas objects to this request as vague and ambiguous as to the term "backgrounds." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas has conducted a reasonable search and has not found any responsive documents within its possession, custody, or control.
j. In this context, SoCalGas understands the phrase "additional external expertise" to mean the use of contractors with specialized experience and equipment. Onyx Oil Services (Onyx) supplied the 2" piping, the choke manifold and the gas/liquid separator that connected the wellhead to the Halliburton pump and the storage tank, for the well kill activities on October 24, 2015. The primary function of the Onyx personnel was to set up the surface piping, then operate their surface equipment under the supervision of SoCalGas. Onyx personnel followed the direction of SoCalGas during the well kill and made no decisions or recommendations while the kill fluid was being pumped. For a list of the personnel and their roles, see Response 1.h.
k. Please see the previously provided electronic documents with the following Bates ranges: AC_CPUC_SED_DR_17_0043004-AC_CPUC_SED_DR_17_0043027

AC_CPUC_SED_DR_17_0043462-AC_CPUC_SED_DR_17_0043471
AC_CPUC_SED_DR_17_0044052-AC_CPUC_SED_DR_17_0044054
AC_CPUC_SED_DR_17_0044686-AC_CPUC_SED_DR_17_0044693
AC_CPUC_SED_DR_17_0044998-AC_CPUC_SED_DR_17_0045006
AC_CPUC_SED_DR_17_0046158-AC_CPUC_SED_DR_17_0046254

l. In this context, SoCalGas understands the phrase "additional external expertise" to mean the use of contractors with specialized experience and equipment. For the invoice for field work performed by Onyx Oil Services on October 24, 2015, please see Response 1.h.

m. SoCalGas objects to this request as vague and ambiguous as to "these procedures."

n. See Response 1.a.-b.

o. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Todd Van de Putte, Alan Fortenberry, Oleksiy Garchev, Larry Andrews, Tom Egbert, John Cerulle, Mike Dozier, and Mike Volkmar. In addition, please see the contractors listed on the SoCalGas Daily Operations Report for October 24, 2015 (AC_CPUC_SED_DR_16_0000649 - AC_CPUC_SED_DR_16_0000650). Counsel to SoCalGas coordinated preparation of this data response.

Question 2:

Regarding the statement, "Sunday, October 25 Boots and Coots experts arrive, mobilize and begin evaluation. SoCalGas Media & Employee Communications team participating. Initial information regarding situation."

a. Were the Boots and Coots experts who arrived part of the additional expertise brought in from Halliburton that was mentioned in the statement dated "Saturday, October 24"?

b. Were additional external experts from Halliburton brought in as of Saturday, October 24 who were not the Boots and Coots experts who arrived on Sunday, October 25?

c. If the answer to 2b is yes, please list all such additional, non-Boots and Coots experts from Halliburton who arrived on Sunday, October 25.

d. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 2:

a. No. Halliburton and Onyx personnel assisted with logistics and support (e.g., pump truck) for the well kill activities performed on October 24, 2015. SoCalGas first contacted Boots & Coots after the October 24, 2015 well kill was unsuccessful, and Boots & Coots personnel first arrived at Aliso Canyon on October 25, 2015. SoCalGas generally refers to Boots & Coots as the specialized well control experts who assisted with the well kills and the relief well after arriving at Aliso Canyon on October 25, 2015.

b. Yes. Halliburton personnel, who were not also Boots & Coots personnel, assisted with and provided support for the well kill performed on October 24, 2015.

c. No new Halliburton personnel arrived on Sunday, October 25, 2015, other than those who were Boots & Coots personnel.

d. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Todd Van de Putte, Alan Fortenberry, and

Mike Dozier. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for October 25, 2015 (AC_CPUC_SED_DR_16_0025633) and the contractors listed on the SoCalGas Daily Operations Report for October 25, 2015 (AC_CPUC_SED_DR_16_00000651 - AC_CPUC_SED_DR_16_00000652). Counsel to SoCalGas coordinated preparation of this data response.

Question 3:

With regards to the statement, "Thursday, October 29 – Multiple diagnostics, including initial 'wireline' completed."

a. Please define "wireline" as used in this sentence.
b. Please explain what the wireline did.
c. Please provide the information/data gathered as a result of the "wireline".
d. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 3:

a. The term "wireline" refers to the cabling technology used in the oil and gas industry to lower down equipment, wireline tools, or measuring devices into a wellbore.
b. SoCalGas objects to this request as vague and ambiguous as to the phrase "what the wireline did." Notwithstanding this objection, SoCalGas responds as follows: For Boots & Coots' Daily Report for October 29, 2015, please see previously provided electronic document with Bates range AC_CPUC_SED_DR_16_0025635.
c. See Response 3.b.
d. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for October 29, 2015 (AC_CPUC_SED_DR_16_0025635) and the contractors listed on the SoCalGas Daily Operations Report for October 29, 2015 (AC_CPUC_SED_DR_16_0000659 – AC_CPUC_SED_DR-16_0000660). Counsel to SoCalGas coordinated preparation of this data response.

Question 4:

With regards to the statement, Sunday, November 1—Coiled tubing rig arrives in late afternoon. Adjacent wells killed (one Saturday & one Sunday) in preparation for work on SS-25.

a. Please define the word "killed" in the context of the above statement.
b. Which adjacent wells were killed?
c. Why were these adjacent wells killed in preparation for work on SS-25?
d. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 4:

a. Killing a well refers to the process of introducing a hydrostatic head of fluid into the well tubulars that exceeds the pressure of the gas trying to escape. When the hydrostatic head pressure exceeds the gas pressure, gas is not able to escape up through the well tubulars.

b. SS25A and SS25B.
c. Due to the close proximity of SS25A and SS25B to SS25, each well was plugged and filled with kill fluid as a precautionary measure.
d. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for November 1, 2015 (AC_CPUC_SED_DR_16_0025638) and the contractors listed on the SoCalGas Daily Operations Report for November 1, 2015 (AC_CPUC_SED_DR_16_0000665 - AC_CPUC_SED_DR_16_0000666). Counsel to SoCalGas coordinated preparation of this data response.

Question 5:

With regards to the statement, "Tuesday, November 3, 2015 – Coiled tubing ready set up and connected, started pressure testing."

a. What was the purpose of setting up the coil tubing?
b. What was the purpose of starting the pressure testing?
c. What were the pressure testing results?
d. Provide documentation showing the pressure testing results.
e. What course of action did SoCalGas take as a result of the pressure testing results?
f. Did SoCalGas follow its pressure testing procedure?
g. If the answer to 6f is yes, provide the procedure that was followed. Please cite the page, and quote the part of it that was specifically followed.
h. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 5:

a. The coiled tubing unit was set up to clear a suspected obstruction in the SS-25 tubing. Boots & Coots personnel were directly responsible for operating the coiled tubing.
b. The purpose of pressure testing in this context was to test the safety equipment and equipment that would be used in the coiled tubing operation. Boots & Coots personnel directly performed the pressure testing and may have additional information on this issue.
c. Please see Boots & Coots' Daily Report for November 3, 2015 please see previously provided electronic document with Bates range AC_CPUC_SED_DR_16_0025640.
d. Please see Response 5.c.
e. Boots & Coots continued operations to clear the suspected obstruction in the SS-25 tubing. Boots & Coots personnel performed the pressure testing and may have additional information on this issue.
f. SoCalGas objects to this request to the degree that it assumes SoCalGas performed the pressure testing on the equipment to be used for the coiled tubing operation.
g. See Response 5.f.
h. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for November 3, 2015 (AC_CPUC_SED_DR_16_0025640) and the contractors

listed on the SoCalGas Daily Operations Report for November 3, 2015 (AC_CPUC_SED_DR_16_0000670 - AC_CPUC_SED_DR_16_0000672). Counsel to SoCalGas coordinated preparation of this data response.

Question 6:

With regards to the statement, "Friday, Nov. 6, 2015 – Coiled tubing rig begins breaking through the blockage and introducing fluid into the well."

a. Please describe the blockage, including the location and depth.
b. Were any noise and temperature readings taken after October 23, 2015 and prior to inserting the coiled tubing? If so:
   i. How many?
   ii. What date was each taken?
   iii. What were the results of each reading?
   iv. Provide the results of each reading.
   v. What information, procedures, or other sources did SoCalGas based its decision upon to insert coiled tubing?
   vi. Provide all sources of the information identified in response to question 6v.
c. Was this the first time after the beginning of the incident that fluid was introduced into the well?
d. If not, when was the first time fluid was introduced into the well?
e. What was the purpose of introducing the fluid into the well?
f. Provide documentation from prior to the introduction of fluid into the well that showed the purpose and intent of introducing that fluid.
g. Did the fluid achieve its intended purpose?
h. Provide all documentation and communication supporting the answer to question 6f.
i. Did SoCalGas consider this a top-well kill attempt? Please explain.
j. Was this the first time SoCalGas introduced fluid into SS-25 following the incident on October 23, 2015? If not, list all other instances, including dates.
k. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 6:

a. Please see previously provided Boots & Coots' Daily Report dated November 6, 2015, with Bates range AC_CPUC_SED_DR_16_0025643.
b. Please see previously provided Boots & Coots' Daily Reports from October 25, 2015 through November 6, 2015 with Bates range AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025643.
c. No.
d. October 24, 2015.
e. SoCalGas objects to this request as vague and ambiguous as to time. Notwithstanding this objection, SoCalGas responds as follows: To the extent CPUC-SED is requesting information about the first time fluid was introduced into the well, well kill fluid was pumped into SS-25 on October 24, 2015. The purpose of pumping the well kill fluid was to introduce a hydrostatic head of fluid into the well that exceeded the pressure of the gas in the well.

f. SoCalGas objects to this request as vague and ambiguous as to time. Notwithstanding this objection, SoCalGas responds as follows: To the extent CPUC-SED is requesting information about the first time fluid was introduced into the well following discovery of the leak, well kill fluid was pumped into SS-25 on October 24, 2015. For SoCalGas' Gas Standards which describe the well kill process for routine situations, please see electronic documents with Bates range AC_CPUC_SED_DR_17_0000128 - AC_CPUC_SED_DR_17_0000142. While the kill of SS25 was not a routine situation, the purpose and use of the well kill fluids provided in the Gas Standard is consistent. In addition, for communications identified by searching relevant SoCalGas' employees email data sets to locate emails related to the incident response on October 23-24, 2015, please see previously provided electronic documents with Bates range AC_CPUC_SED_DR_33_0000003 - AC_CPUC_SED_DR_33_0000163.

g. SoCalGas objects to this request as vague and ambiguous as to time. Notwithstanding this objection, SoCalGas responds as follows: To the extent CPUC-SED is requesting information about the first time fluid was introduced into SS-25 on October 24, 2015, no, because the October 24, 2015 well kill attempt was not successful. To the extent CPUC-SED is requesting information about the introduction of fluid on November 6, 2015, yes because the November 6, 2015 blockage removal was successful.

h. We interpret this question as seeking documentation in support of 6g. See Response 6.f.

i. SoCalGas objects as vague and ambiguous as to the term "this." To the extent that CPUC-SED is requesting information about the activities on November 6, 2015, those activities do not constitute a well kill attempt.

j. Other than in connection with the October 24, 2015 kill activities, no fluid was introduced into SS-25 prior to the coiled tubing operation.

k. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for November 6, 2015 (AC_CPUC_SED_DR_16_0025643) and the contractors listed on the SoCalGas Daily Operations Reports for October 24 through November 6, 2015 (AC_CPUC_SED_DR_16_0000649 - AC_CPUC_SED_DR_16_0000681). Counsel to SoCalGas coordinated preparation of this data response.

Question 7:

With regards to the statement, "Sunday Nov. 8, 2015 – Well-management experts continue multi-day evaluation. The focus was on continued evaluation of the well pipe conditions."

a. List the sources of information were used by the well-management experts during their "continued evaluation of the well pipe conditions".
b. Provide the sources of information used by the well-management experts during their "continued evaluation of the well pipe conditions".
c. Were any of the sources of information used by the well-management experts during their "continued evaluation of the well pipe conditions" inaccurate?
d. If the answer to 7c is yes, provide all inaccurate sources of information used by the well-management experts.
e. What were the conclusions, findings and other results of the "continued evaluation of the well pipe conditions".
f. Was the "continued evaluation of the well pipe conditions" only for SS-25? If not, list all wells it was for?
g. What was the purpose of the "continued evaluation of the well pipe conditions"?

h. Provide a list with the names of all of the "well-management experts" that were part of the "multi-day evaluation". Be sure this list includes those who were part of the "multi-day evaluation" identified on Monday November 9, 2015 as well.
i. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 7:

a. SoCalGas objects to the phrase "sources of information" as vague and ambiguous. SoCalGas further objects on the grounds that the particular sources of information used by Boots & Coots in the course of continued evaluation of well pipe conditions is beyond SoCalGas' scope of knowledge. SoCalGas understands "well management experts" to mean Boots & Coots. Notwithstanding this objection, please see previously provided Boots & Coots' Daily Report for November 8, 2015 with Bates range AC_CPUC_SED_DR_16_0025645. Boots & Coots may have additional information responsive to this request.
b. See Response 7.a.
c. See Response 7.a. SoCalGas has no reason to believe that Boots & Coots used or relied on any inaccurate information in the course of evaluating well pipe conditions.
d. N/A.
e. See Response 7.a.
f. The "continued evaluation of the well pipe conditions" was for SS25 only. Boots & Coots may have additional information.
g. The purpose of the "continued evaluation of the well pipe conditions" was to collect more data from SS25 and assess the leak. Boots & Coots may have additional information as to the purpose of the continued evaluation.
h. We understand this request to be seeking names of Boots & Coots personnel. Boots & Coots' Daily Reports for November 8-9, 2015 include a list of Boots & Coots personnel performing the evaluation of the well pipe conditions. Please see previously provided electronic documents Bates range AC_CPUC_SED_DR_16_0025645 – AC_CPUC_SED_DR_16_0025646.
i. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Reports for November 8-9, 2015 (AC_CPUC_SED_DR_16_0025645 - AC_CPUC_SED_DR_16_0025646) and the contractors listed on the SoCalGas Daily Operations Report for November 8 and 9, 2015 (AC_CPUC_SED_DR_16_0000685 - AC_CPUC_SED_DR_16_0000690). Counsel to SoCalGas coordinated preparation of this data response.

Question 8:

Regarding the statement, "November 10, 2015 - Additional well testing work performed."

a. Please identify all additional well testing work performed.
b. Was this well testing work performed in accordance with procedure?
c. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 8:

a. Please see previously provided Boots & Coots' Daily Report dated November 10, 2015 with Bates range AC_CPUC_SED_DR_16_0025647.
b. SoCalGas objects to this request as vague and ambiguous as to the term "procedure."
c. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for November 10, 2015 (AC_CPUC_SED_DR_16_0025647) and the contractors listed on the SoCalGas Daily Operations Report for November 10, 2015 (AC_CPUC_SED_DR_16_0000691 - AC_CPUC_SED_DR_16_0000693). Counsel to SoCalGas coordinated preparation of this data response.

Question 9:

Regarding the statement, "November 11 - Conducted data analysis, finalized strategy to stop the leak, and began preparing the site with the appropriate well-control equipment."

a. List all sources of data used to conduct the data analysis.
b. Were any of these sources of data inaccurate?
c. If the answer to question 9b is yes, which ones?
d. If the answer to question 9b is yes, when did SoCalGas learn such information was inaccurate?
e. If the answer to question 9b is yes, how did SoCalGas learn such information was inaccurate?
f. If the answer to question 9b is yes, provide all sources of inaccurate data used in the data analysis conducted.
g. Has SoCalGas corrected the inaccurate data?
h. If so, when was the data corrected?
i. If so, how was SoCalGas able to correct the inaccurate data?
j. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 9:

a. SoCalGas objects to this request to the degree that it assumes SoCalGas performed the data analysis on November 11, 2015. Boots & Coots conducted the data analysis on November 11, 2015. The particular sources of data used by Boots & Coots for purposes of the data analysis is beyond SoCalGas' scope of knowledge. Notwithstanding this objection, SoCalGas responds as follows: Please see previously provided Boots & Coots' Daily Report for November 11, 2015 with Bates range AC_CPUC_SED_DR_16_0025648. Boots & Coots may have additional information on this issue.
b. See Response 9.a. SoCalGas has no reason to believe that any sources of data that Boots & Coots used during that period was not accurate.
c. N/A.
d. N/A.
e. N/A.

f. N/A.
g. N/A.
h. N/A.
i. N/A.
j. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for November 11, 2015 (AC_CPUC_SED_DR_16_0025648) and the contractors listed on the SoCalGas Daily Operations Report for November 11, 2015 (AC_CPUC_SED_DR_16_0000694 - AC_CPUC_SED_DR_16_0000696). Counsel to SoCalGas coordinated preparation of this data response.

Question 10:

Regarding the statement, "Nov 12, 2015 - Successfully installed the "bridge plug" in the well tubing and continued to prepare the well site."

a. What was SoCalGas's complete goal for installing the "bridge plug"?
b. Was SoCalGas's installation of the bridge plug an attempt to stop the leak of gas from well SS-25?
c. Provide all documentation dates November 12, 2015 and prior to that date supporting the answer to question 10b.
d. What were the purposes, goals and objectives related to installing the bridge plug?
e. Provide all documentation from November 12, 2015 and prior to that date showing the purposes, goals and objectives relating to installation of the bridge plug.
f. Did the installation of the bridge plug meet all purposes, goals and objectives from prior to its installation?
g. Provide all documentation (including communications) showing whether the installation of the bridge plug met all purposes, goals and objectives provided in response to question 10f?
h. Prior to the beginning of the installation of the bridge plug on November 12, 2015, in what precise location of the well tubing was the bridge plug intended to be installed?
i. Provide all documentation and communication supporting the answer to question 9h.
j. Provide the plans and specifications from November 12, 2015 and prior to that date showing the location in the tubing in which the bridge plug was to be installed.
k. Was the bridge plug successfully installed in its intended precise location in the well tubing?
l. If the answer to question 10k is no, what prevented the bridge plug from being successfully installed in its intended location within the tubing?
m. If the bridge plug was not installed in its precise location that was intended prior to its installation, was SoCalGas able to remove it or drill it out?
n. If the answer to question 9m is no, why not?
o. If the bridge plug did not achieve the stated purposes, goals and objectives
p. Provide the procedure for installation of the bridge plug in step-by-step fashion.
q. If there was no procedure for installing the bridge plug, why not?
r. Was the procedure for installing the bridge plug followed?
s. If not, why not?
t. Which individuals proposed installing the bridge plug?

u. Were any consequences of installing a bridge plug contemplated prior to the time it was installed? If so, what were they?
v. Provide all documentation (including communications) showing the answers to question 10u.
w. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 10:

a. SoCalGas objects to the term "complete goal" as vague and ambiguous. The purpose, goal, and/or objective for the bridge plug installation in conjunction with the tubing perforation, was to create a known flow area in the tubing in order to kill the well. Boots & Coots performed the installation of the bridge plug and may have additional information.
b. See Response 10.a.
c. SoCalGas understands that the goal for installing the bridge plug was to facilitate a top-kill through the tubing. For Boots & Coots' Daily Report for November 12, 2015, please see previously provided electronic documents with Bates range AC_CPUC_SED_DR_16_0025649. In addition, SoCalGas previously provided CPUC-SED requested communications between SoCalGas and Boots & Coots. Those documents were identified by searching relevant SoCalGas employees' email data sets to locate emails to/from Boots & Coots from October 1, 2015 to January 31, 2018. Please see electronic documents with Bates Range AC_CPUC_SED_DR_16_0001027-AC_CPUC_SED_DR_16_0019407.
d. See Response 10.a.
e. See Response 10.c.
f. SoCalGas understands that the purpose, goal, and objective of installing the bridge plug was to create a known flow area in the tubing, and that this purpose, goal, and/or objective was met.
g. See Response 10.c.
h. SoCalGas understands that the bridge plug was to be installed at the lowest depth possible above the subsurface safety valve ports.
i. See Response 10.c.
j. See Response 10.c.
k. SoCalGas understands that the bridge plug was set at the lowest depth possible above the subsurface safety valve ports.
l. N/A.
m. N/A.
n. SoCalGas objects to this request as vague and ambiguous as to "9m." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas interprets this request as relating to Question 10m. N/A.
o. SoCalGas objects to this request as vague and ambiguous as to "If the bridge plug did not achieve the stated purposes, goals and objectives."
p. See Response 10.c.
q. See Response 10.c.
r. See Response 10.c.
s. See Response 10.c.
t. Boots & Coots.
u. Yes, Boots & Coots explained that installation of the bridge plug would remove access to the tubing below the bridge plug.

v. SoCalGas previously provided CPUC-SED requested communications between SoCalGas and Boots & Coots. Those documents were identified by searching relevant SoCalGas employees' email data sets to locate emails to/from Boots & Coots from October 1, 2015 to January 31, 2018. Please see electronic documents with Bates Range AC_CPUC_SED_DR_16_0001027-AC_CPUC_SED_DR_16_0019407.

w. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane, and Todd Van de Putte. In addition, please see the Boots & Coots personnel listed on the Boots & Coots Daily Report for November 12, 2015 (AC_CPUC_SED_DR_16_0025649) and the contractors listed on the SoCalGas Daily Operations Report for November 12, 2015 (AC_CPUC_SED_DR_16_0000697 - AC_CPUC_SED_DR_16_0000699). Counsel to SoCalGas coordinated preparation of this data response.

Question 11:

Regarding the statement "November 13 - Tubing perforation activities performed and attempted stop the flow of gas by putting fluids down the well. During this operation, there was a release of a mist into the air. Based on the information at this time, it is not believed that these materials pose a threat to public health."

a. Explain the purpose, objectives and goals related to the tubing perforation activities?
b. Provide all documentation prior to performance of tubing perforation activities that show the purpose, objectives and goals related to the tubing perforation activities?
c. Were the goals, objectives and purpose related to the tubing perforation activities met?
d. If the answer to question 11c is no, which goals, objectives and purposes relating to the tubing perforation activities were not met? Please explain.
e. Were any consequences of tubing perforation activities the time they began? If so, what were they?
f. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 11:

a. See Response 10.a.
b. SoCalGas previously provided CPUC-SED requested communications between SoCalGas and Boots & Coots. Those documents were identified by searching relevant SoCalGas employees' email data sets to locate emails to/from Boots & Coots from October 1, 2015 to January 31, 2018. Please see electronic documents with Bates Range AC_CPUC_SED_DR_16_0001027-AC_CPUC_SED_DR_16_0019407.
c. SoCalGas understands that the purpose, goal, and/or objective for perforating the tubing in conjunction with installing the bridge plug, was to create a known flow area in the tubing in order to kill the well, and was met.
d. N/A.
e. SoCalGas objects to this request as vague and ambiguous as to "[w]ere any consequences of the tubing perforation activities the time they began?"
f. SoCalGas objects to this request as overly broad and vague as to the terms "this question" and "the question." SoCalGas interprets the request to be seeking the identities of individuals that may have first-hand knowledge of the events described in the above responses. SoCalGas responds as follows: Bret Lane and Todd Van de Putte. In addition, please see the

Boots & Coots personnel listed on the Boots & Coots Daily Report for November 13, 2015 (AC_CPUC_SED_DR_16_0025650) and the contractors listed on the SoCalGas Daily Operations Report for November 13, 2015 (AC_CPUC_SED_DR_16_0000700 - AC_CPUC_SED_DR_16_0000702). Counsel to SoCalGas coordinated preparation of this data response.

Question 12:

Regarding the statement "November 14-25, 2015 – Four top-well kill attempts were made by Boots and Coots by attempting to pump various types of fluid down the well."

a. Please describe each top well kill attempt made by Boots and Coots in detail.
b. Please include precise dates of each one.
c. Please provide a detailed list of all fluids used in each top-well kill attempt.
d. Please provide the order in which the various fluids were pumped down the well.
e. Were any others involved in the execution of these well kill attempts? If so:
    i. List them.
    ii. Explain the roles of each one.
f. With regards to the top well-kill attempts, what options, if any, were no longer feasible after the installation of the bridge plug in the tubing?
g. In what ways did the bridge plug prevent the attempted Boots and Coots top-well kill attempts from succeeding?
h. Given these and other well kill attempts, did SoCalGas and its consultants consider flaring the gas released from SS-25?
i. If the answer to question 12f is yes, at what point was this considered?
j. Why did SoCalGas not flare the gas released from SS-25?

Response 12:

a. On November 15, kill attempt #3 was performed by pumping a barite pill and brine into the well. On November 18, kill attempt #4 was performed by pumping a barite pill and brine into the well. On November 24, kill attempt #5 was performed by pumping a Geo Zan pill, barite pill, water, and brine into the well. On November 25, kill attempt #6 was performed by pumping a Geo Zan pill, barite pill, water, and brine into the well. For further detail regarding these kill attempts, please refer to previously provided electronic documents with Bates range AC_CPUC_SED_DR_16_0000709 (November 15), AC_CPUC_SED_DR_16_0000718 (November 18), AC_CPUC_SED_DR_16_0000735 (November 24), and AC_CPUC_SED_DR_16_0000738 (November 25).
b. Between November 14, 2015 and November 25, 2015, Boots & Coots performed well kill operations on the following dates:
    - November 15, 2015
    - November 18, 2015
    - November 24, 2015
    - November 25, 2015
c. Fluids used in each well kill attempt performed between November 14, 2015 and November 25, 2015 are as follows:
    - November 15, 2015: 9.4 ppg $CaCl_2$, 18.0 ppg barite pill
    - November 18, 2015: 9.4 ppg $CaCl_2$, 18.0 ppg barite pill
    - November 24, 2015: GEO Zan pill loaded with LCM, fresh water, 18.0 ppg barite pill

- November 25, 2015: GEO Zan pill loaded with LCM, fresh water, 9.4 ppg $CaCl_2$

d. Fluids were pumped in the following order:
   - November 15, 2015: 9.4 ppg $CaCl_2$, followed by 18.0 ppg barite pill, followed by 9.4 ppg $CaCl_2$
   - November 18, 2015: 9.4 ppg $CaCl_2$, followed by 18.0 ppg barite pill, followed by 9.4 ppg $CaCl_2$
   - November 24, 2015: GEO Zan pill loaded with LCM, followed by fresh water, followed by 18.0 ppg barite pill, followed by 9.4 ppg $CaCl_2$
   - November 25, 2015: GEO Zan pill loaded with LCM, followed by fresh water, followed by GEO Zan pill loaded with LCM, followed by 9.4 ppg $CaCl_2$

e. Other contractors provided support in performing the well kill attempts. For a list of contractors, please see SoCalGas' Daily Operations Reports for November 15, 18, 24, and 25 (see AC_CPUC_SED_DR_16_0000706 - AC_CPUC_SED_DR_16_0000708 (November 15), AC_CPUC_SED_DR_16_0000715 - AC_CPUC_SED_DR_16_0000717 (November 18), AC_CPUC_SED_DR_16_0000732 - AC_CPUC_SED_DR_16_0000734 (November 24), AC_CPUC_SED_DR_16_0000735 - AC_CPUC_SED_DR_16_0000737 (November 25)).

f. SoCalGas is unaware of the options that may have been no longer feasible as a result of the installation of the bridge plug.

g. SoCalGas objects to this request to the degree that it assumes facts with regards to the statement "bridge plug prevented the attempted Boots & Coots top-well kill attempts from succeeding." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas is unaware of any ways in which the installation of the bridge plug prevented the attempted Boots and Coots top-well kill attempts from succeeding.

h. SoCalGas objects to this request as vague and ambiguous as to the phrase "flaring the gas release from SS-25." Notwithstanding this objection, SoCalGas responds as follows: Yes.

i. SoCalGas objects to this request as vague and ambiguous as to the phrase "flaring the gas release from SS-25" and the term "12f." Notwithstanding this objection, SoCalGas responds as follows: On or around November 2015.

j. SoCalGas objects to this request as vague and ambiguous as to the phrase "flaring the gas release from SS-25." Notwithstanding this objection, SoCalGas responds as follows: After extensive design and study, SoCalGas ultimately determined not to install the gas capture system at SS-25 that would have resulted in the flaring of gas at SS-25 because of safety concerns expressed by our engineers, including Boots & Coots.

Question 13:

Are the words in the draft response now final?

a. If not, please edit the draft response so it is final, and track the changes. Please also provide a clean version.
b. Please provide all individuals with knowledge of the answers to this question. Please include those who wrote the answer to the question.

Response 13:

SoCalGas objects to this request as overly broad, unduly burdensome and vague and ambiguous. Notwithstanding this objection, SoCalGas responds as follows: The "DRAFT Timeline of Events" provided in response to the CPUC-SED Data Request to SoCalGas dated November 13, 2015, represented the best information available as of November 15, 2015. Based on the context of the other questions in this data request SoCalGas understands this request as seeking a detailed technical account of

all efforts to control the well. The most complete and detailed account can be found in the compiled and previously provided SoCalGas Daily Operations Reports (AC_CPUC_SED_DR_16_0000361 - AC_CPUC_SED_DR_16_0001026) and Boots & Coots Daily Reports (AC_CPUC_SED_DR_16_0025631 - AC_CPUC_SED_DR_16_0025808).

a. N/A.
b. SoCalGas objects to this request as overly broad and vague as to the terms "this question,", "the question," and "final." Counsel to SoCalGas coordinated preparation of this data response.

Question 14:

Please provide all individuals responsible for writing the draft timeline of events. Please include all individuals who were responsible for preparation of the writing.

Response 14:

To the extent CPUC-SED is referring to the "DRAFT Timeline of Events" provided in response to the CPUC-SED Data Request to SoCalGas dated November 13, 2015, the Draft Timeline of Events was prepared by SoCalGas' Aliso Canyon Incident Public Information Office.

Question 15:

Please refer to the SoCalGas statement in response to SED's Data Request from November 13, 2015, question number 7, which stated:

"October 23 - After the leak was discovered, the site was secured and SoCalGas crews at the facility immediately took a step-by-step approach to locate and seal the leak at the wellhead. First, SoCalGas brought in a contractor (Cameron) to attempt to stop the leak by making a repair to the wellhead seals. This occurred early on October 24. When this first step was not successful, SoCalGas continued to monitor well pressures, brought in additional contractors (Halliburton and Onyx), and ordered well abatement equipment to be delivered to the wellhead. SoCalGas and our contractors then attempted to stop the flow of gas from SS-25 by pumping a polymer carbonate fluid down the well at approximately 12:30 pm on October 24. We were unable to pump the necessary fluid down the well using this procedure. As a result, this effort was also not successful in stopping the leak. At approximately 2:30 pm on October 24, SoCal Gas shut down this pumping operation."

a. Provide the contract between SoCalGas and Cameron that was created for the purpose of Cameron's attempt to stop the leak by making a repair to the wellhead seals.
b. Provide Cameron's qualifications for making repairs to wellhead seals.
c. Why did SoCalGas think it was needed to make repairs to the wellhead seals?
d. Why was Cameron's attempt to repair the wellhead seals not successful?
e. Provide the contact information for Cameron.

Response 15:

a. Cameron West Coast's (Cameron) work at SS-25 was performed under an existing Standard Services Agreement with SoCalGas. For SoCalGas' agreements with Cameron please see previously provided electronic documents with Bates range AC_CPUC_SED_DR_17_0045052 – AC_CPUC_SED_DR_17_0045093.
b. SoCalGas objects to this request as overly broad and unduly burdensome, and vague and ambiguous as to "qualifications." Notwithstanding this objection, SoCalGas responds as

follows: SoCalGas has conducted a reasonable search and has not found any responsive documents within its possession, custody, or control.

c. SoCalGas personnel investigating the leak on the evening of October 23, 2015 heard a noise that sounded like gas moving down the well and suspected that a leaking wellhead seal may have been the cause.

d. Cameron's attempt to repair the wellhead seal was successful, however, this did not stop the leak.

e. Please see 1.a.

Response to Data Request

Response to SED Data Request-63

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 63 related to the Reply Testimony of Mr. L. William Abel on behalf of SoCalGas.

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Version Record

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1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on April 2, 2020. Data Request No: SED 63 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED DR 63 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The passages are from the document titled: Chapter III, Prepared Reply Testimony of L. William Abel on behalf of Southern California Gas Company (U 904 G) (file name: "3_Ch. III - Abel (A Final).pdf").

2 Questions and Responses

2.1 Question 1

1. On page 12, "Blade's modeling simply represents an academic exercise to calculate the kill fluid density and pump rate that theoretically *could have* killed SS-25, and fails to account for several important safety considerations that impacted Boots & Coots' well kill efforts. First, as Boots & Coots explained to SED during SED's August 2018 examination, the first step upon arriving at a well control event is to secure the area and ensure the safety of personnel. [Footnote omitted.]. Indeed, as discussed in SoCalGas' opening testimony, safety is a paramount consideration in any well control operation, and the response to the SS-25 leak was no different—extensive measures were implemented to mitigate the risk of ignition. [Footnote omitted]. Second, in designing a well kill plan, a well control company must take extreme caution not to implement a well kill operation that may worsen the leak, and thereby increase the risk of ignition, or jeopardize the success of subsequent kill attempts. Boots & Coots appropriately considered these factors, and made adjustments to its kill operations accordingly." With this passage on mind, please answer:

2.1.1 Questions and Blade Responses

a. Does Blade agree that, "Blade's modeling simply represents an academic exercise to calculate the kill fluid density and pump rate that theoretically could have killed SS-25?"

   No.

b. If Blade disagrees with this statement, please state the reasons for disagreeing.

   Blade's efforts to model the kill operations were not an academic exercise—it was specifically to ascertain why the top kill well-control efforts were unsuccessful and why it took 111 days to stop the gas from the Aliso Canyon gas storage reservoir from escaping to the atmosphere. As discussed in the Blade Report [1] (page 229), Blade conducted a transient kill simulation study to evaluate the likelihood of success of the actual kill attempts. Blade intentionally used the same field data that were available to the onsite well control personnel during the time of well kill operations for this evaluation. According to Blade's modeling, all the SS-25 kill attempts were predicted to be unsuccessful.

   It is not clear to Blade how Boots and Coots selected the pump rates and kill fluid densities for each kill attempt. The kill fluid densities did not change materially until kill attempt #7.

c. Does Blade take the position that its modeling would have successfully killed well SS-25?

   Because of the modeling and kill attempt operational uncertainties, no one can guarantee a successful well kill strictly based on modeling results. Modeling to determine a plan for the pumping operations is the first important component of a well kill plan. The modeling uses available data and reasonable engineering assumptions for unknown data. In fact, the advantage of modeling is that it allows for evaluation of uncertainties in the data and assumptions. The second component of a kill operation is to carry out the pumping operations according to the plan developed through modeling. If the modeling results are flawed, or if the pumping operation does not go as planned, a well kill attempt will likely be unsuccessful.

Blade takes the position that kill modeling is necessary to properly plan a kill operation where early success in killing the well is of high importance. Such modeling could include transient kill modeling or other analytical approaches that take into account pressure, kill fluid properties, flow rates and restrictions in the flow path. There was no evidence provided to Blade that kill modeling or other analytical approaches were undertaken for kill attempts #1 through #6.

Furthermore, Blade contends that by the time of kill attempt #2, the complexity of the kill operation should have been well understood. Twenty days were available to gather data on the well conditions during the time interval between kill attempts #1 and #2. Diagnostic logs were run in the well showing temperature anomalies and possible leak depths. By then it was clear that there was a leak in the 7 in. casing at some shallow depth; and this was documented in the daily reports. This time period was adequate to conduct kill modeling. Gas was flowing from the reservoir up through the 7 in. casing × 2 7/8 in. tubing annulus and then outside of the 7 in. casing. The gas was escaping into the surrounding formation and some was migrating to the surface. This was not a standard top kill operation based on the available data.

The following are examples of data and assumptions that could have been made regarding the leak severity, leak depth, and flow path:

- The SoCalGas SS-25 daily report for October 24, 2015 [2] stated "At this time, It [sic] appears that we had a wellhead seal leak and/or a very shallow 7" production casing leak."
- The temperature log run on November 8, 2015 [3], showed cooling anomalies at 365 ft and 890 ft indicating the possible depths of gas expansion and cooling associated with a leak.
- The Boots & Coots daily report on November 13, 2015 (Add Energy Report [4], page 89, AC_BLD_0031392), stating that after pumping junk shots down the 2 7/8 in. × 7 in. annulus, brine was observed after 5 bbl were pumped.
- Both Add Energy [4] (page 9, AC_BLD_0031312) and Blade [5] (page 51) estimated the SS-25 gas flow rate using data that was available at the time of the leak. Add Energy stated on page 7, "This estimated flow rate is not dependent of the flow path from the bottom of the tubing to surface, but only calculated based on pressures and the inflow performance relation (IPR) estimated from well tests."

A kill design is based on the well parameters such as geometry, flow path restrictions, and gas flow rate as well as the kill parameters including kill fluid density, pump rate, fluid volume, and surface pump pressure. Kill modeling is an effective way of accounting for these variables and their uncertainties and then screening well kill plans to determine which plans may be successful and which are likely to be unsuccessful thereby maximizing the chances of success. Kill modeling is safer, more efficient, and less risky than pumping multiple unsuccessful kill attempts. The risk of unsuccessful kill attempts includes damage to the site and the well's surface equipment that can limit additional kill attempts. The modeling allows learnings from each kill attempt to be incorporated into the next one. The seven unsuccessful kill attempts at SS-25 resulted in a large and deep crater around the wellhead and conductor casing creating a hazardous condition and required waiting for the relief well to stop the gas flow from SS-25 to the atmosphere.

Question 1 includes a comment on safety considerations and the following statement:

> Second, in designing a well kill plan, a well control company must take extreme caution not to implement a well kill operation that may worsen the leak, and thereby increase the risk of ignition, or jeopardize the success of subsequent kill attempts.

Blade agrees with this statement. This is exactly why kill modeling is a necessary component of designing a successful well kill plan. However, evidence indicates that this did not happen at SS-25. The use of higher density fluids, as predicted by the kill modeling, would not have compromised safety during the kill attempts. Specifically, kill attempt #2 resulted in the formation of the crater around the wellhead and conductor. Similarly designed, unsuccessful kill attempts continued after kill attempt #2. During kill attempt #6, the flow line from the 7 in. casing and tubing head broke, monitoring devices were damaged, and the pump line to the casing head broke. The pump line tee broke off because of wellhead movement and the 11 3/4 in. × 7 in. annulus valve backed out during kill attempt #7 allowing the annulus to vent gas at surface and enlarge the crater. The additional kill attempts continued even when the well and surface conditions had deteriorated from after kill attempt #2.

Blade was provided with what appear to be some graphical results of modeling for kill attempt #7, the final SS-25 top kill attempt on December 22, 2015 [6] [7]. Kill modelling was not mentioned in the August 8, 2018, Examination Under Oath of Mr. Danny Walzel and Mr. James Kopecky [8] (pages SED 00635 – SED 00786). It is clearly stated in this document that Boot & Coots did not calculate the well flow rate which is a key variable needed for developing a kill plan (pages SED 00736 – SED 00737).

It appears from data provided to Blade that kill modeling was performed in preparation for kill attempt #7, unlike the lack of any modeling prior to the previous six kill attempts. But by this time the surface conditions had deteriorated from previous attempts and wellhead movement and safety concerns prevented the kill fluids from being pumped according the plan. Kill attempt #7 appeared to come close to killing the well, but it was terminated because of undesirable movement of the wellhead and pump lines that broke during the job. It is important to note that the kill attempt #7 fluid densities were similar to the results from the Blade transient kill models for the previous kill attempts.

d. If so, what is the factual basis for such a position?

As discussed in Question 1 c, modeling by itself cannot ensure a successful well kill.

e. Were the adjustments to kill operations that Mr. Abel mentions disclosed to Blade during its Root Cause Analysis?

Blade had access to historical kill data including:

- Some pre-job procedures
- SoCalGas daily operations reports
- Boots & Coots daily operations reports
- Halliburton post-job reports
- DOGGR daily operations summary reports

However, the rationale and the factors considered in designing the kill attempts were not made available to Blade.

The subject of kill modeling was raised many times with SoCalGas during the RCA. Multiple data requests were sent to SoCalGas regarding the kill attempts, rationale behind the kill attempts, and associated kill data. Consequently, Blade requested a discussion meeting and suggested the Boots & Coots personnel who were onsite and were associated with planning and executing the kill attempts join the discussion meeting [9]. Such a meeting never occurred.

f. If so, did Blade consider whether Boots & Coots appropriately considered all factors and made correct adjustments to its kill operations?

As discussed in the response to Question 1 e, the rationale for the well kill adjustments were not disclosed to Blade.

Although requested, Blade did not have direct access to the Boots & Coots personnel to determine if Boots & Coots appropriately considered all factors and made correct adjustments to its kill operations. Our review of the Boots & Coots well kill plans for attempts #2 – 6 did not document the rationale for the kill attempts. The 2018 Boots & Coots Examination Under Oath [8] did not have the details required to ascertain whether Boots & Coots considered all factors.

In Blade's view, kill attempt #7 had significant adjustments to the kill plan from previous kill attempts, and it was similar to the results of the Blade modeling.

g. Provide any documents and necessary additional context to support the answers provided.

Two documents were provided by SoCalGas to Blade that appear to be graphical results of kill modeling. These graphs appear to be generated within Schlumberger's *Drillbench* software. This is industry standard well control modeling software and the same software that Blade used in its kill analysis. Images of the documents are included in Figure 1 and Figure 2.

Figure 2 shows an AOF (absolute open flow) of 25 MMscf7/D and a gas flow rate of 15 MMscf/D. Blade estimated the well was flowing approximately 57 MMscf/D on December 22, 2015, [5] *SS-25 Well Nodal-Analysis with Uncontrolled Leak Estimation*, page 51. The final kill attempt #7 was pumped on December 22, 2015.

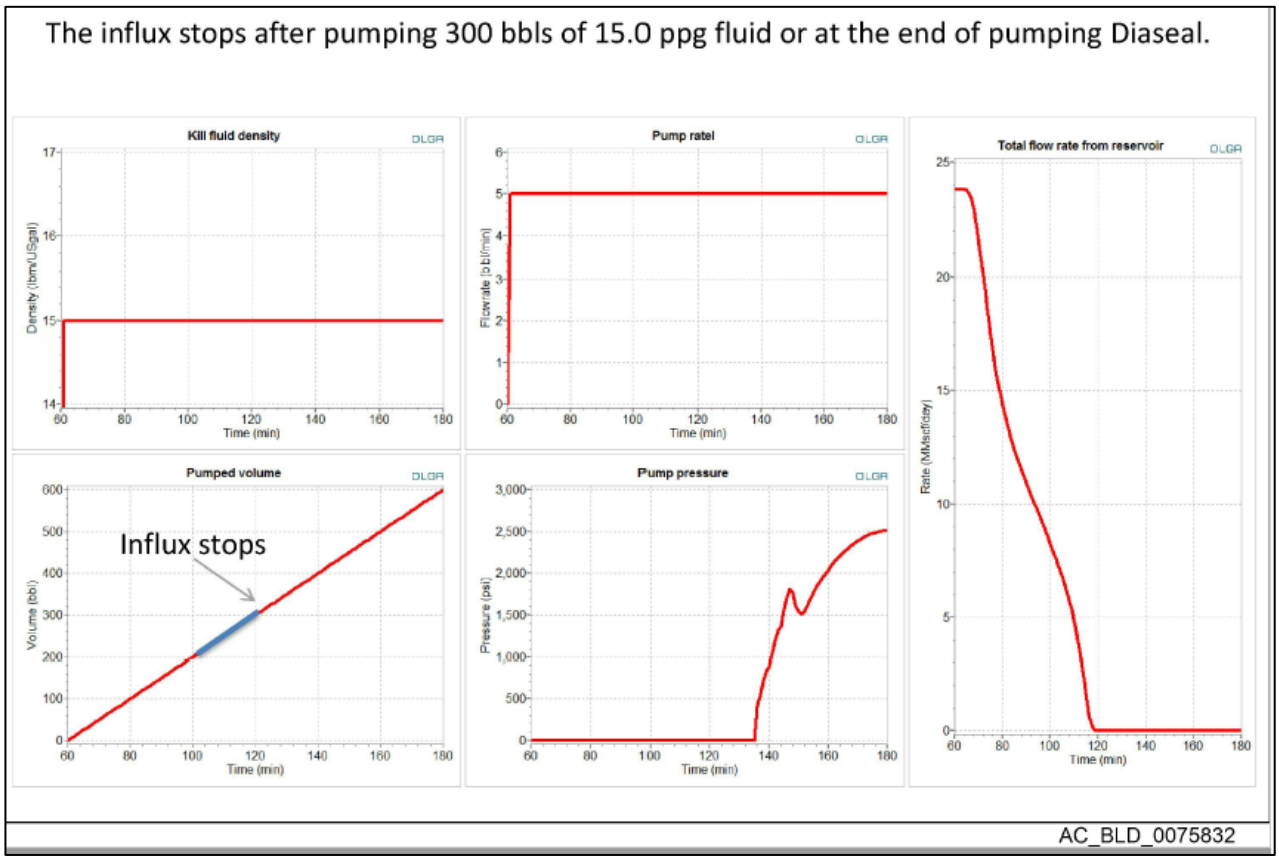
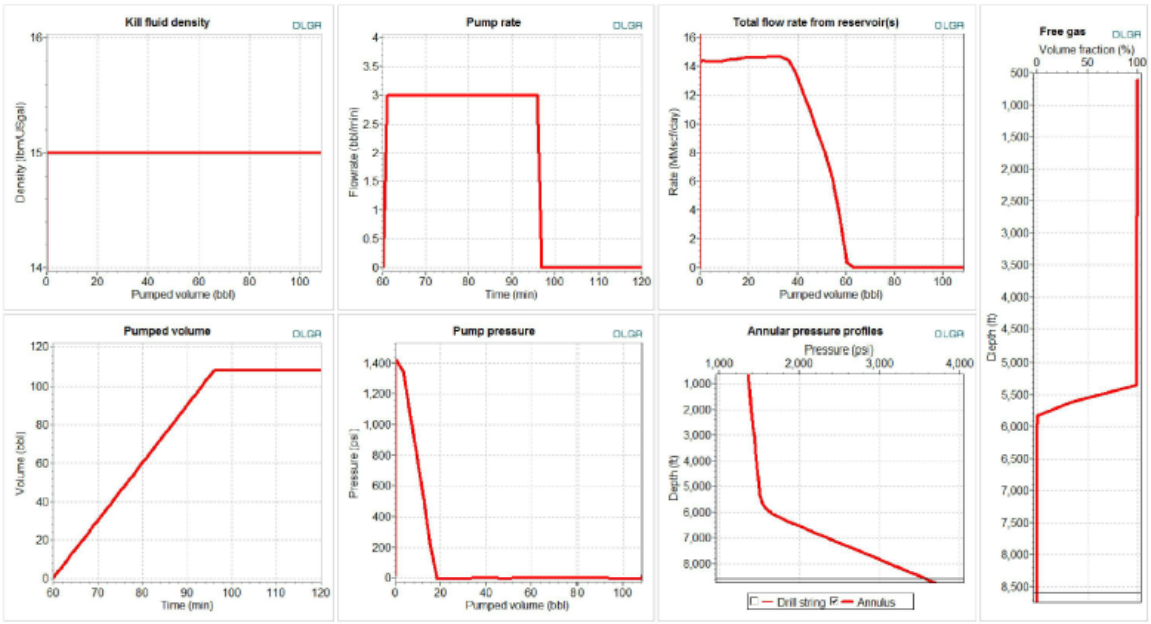


Figure 1: Kill Modeling Graphical Results

Snapshot of pumping 15.0 ppg WBM at the rate of 3 bpm

Basis of simulation:		Results:	
Reservoir pressure:	2,200 psi	Gas flow rate:	15 MMscfd
AOF:	25 MMscfd	Max pump pressure:	1,450 psi
SITP:	1,400 psi	Kill fluid volume:	65 bbls
Depth of exit point:	450 ft MD	Fracture occurs:	105 bbls
Restriction at exit point:	Yes	Top of fluid level in the annulus:	5,500 ft MD
Kill fluid density:	15.0 ppg		
Kill fluid viscosity:	25 cP		



AC_BLD_0075853

Figure 2: Kill Modeling Graphical Results

2.2 Question 2

2. Please refer to the following passage on page 12 of Mr. Abel's testimony: Mr. Walzel testified that while the SS-25 wellhead equipment was rated to 5,000 PSI, given the unknown condition of the leak, Boots & Coots set a "safety limit" or "safety factor" well below the working pressure of the equipment. [Footnote omitted]. I believe that it was prudent for Boots & Coots to have set a safety factor so as not to risk damaging the wellhead." With this passage in mind, please answer:

2.2.1 Questions and Blade Responses

a. Does Blade's modeling consider risk to damaging the wellhead?

Yes. Blade considered the wellhead rated working pressure of 5,000 psi. The Blade kill simulations for all of the kill attempts resulted in a maximum predicted pump pressure of 3,644 psi for kill attempt #2 with decreasing maximum pump pressure for subsequent kill attempts because the reservoir pressure was declining with time. The maximum predicted pump pressure of 3,644 psi is below the "safety limit" set by Boots and Coots of 4,000 psi. The field was on withdrawal during the kill attempts so the reservoir pressure was dropping.

b. What is Blade's view as to whether this alleged "safety factor" below the working pressure of the equipment was prudent so as not to risk damaging the wellhead?

Blade agrees that it is prudent to use a safety factor to avoid damage to the wellhead and surface equipment. Blade's simulations showed that the wellhead pressures would not have exceeded 3,644 psi with the higher fluid densities. The model results honored the wellhead safety factor.

c. In Blade's view, given what could have been known about the condition of well SS-25 and other related factors by Boots & Coots at the time of its well kill attempts, could Boots & Coots have known whether the pump rate and fluid density it used was inadequate to kill well SS-25?

Yes, well kill modeling would have demonstrated that the pump rate and fluid density were inadequate to kill well SS-25.

Data were available on October 23, 2015, October 24, 2015 (when the first kill attempt was pumped), and November 8, 2015 (when a temperature, pressure, and spinner survey was run). These data could have been used for kill modeling to determine whether the planned kill attempt was likely to kill the well. A summary of the data available includes the following:

- October 23, 2015: The wellbore geometry was known, i.e., casing internal diameter, tubing outside and inside diameter, packer depth, ported mandrel with slots depth, perforations depth, etc. It could have been assumed that the flow path was from the perforations, up the casing, through the tubing to the ported mandrel slots, exit the slots, up the 7 in. casing × 2 7/8 in. tubing annulus until the flow exited the 7 in. casing leak into the surface casing × production casing annulus. The tubing was shut in at surface diverting the flow up the annulus. The gas at surface during kill attempt #1 indicated the leak was shallow enough to broach to surface. The flowing casing pressure of approximately 270 psi on October 23, 2015, gave information on the back pressure the leak was flowing against without needing to know the exact flow path of the gas to surface.
- October 23, 2015: The reservoir pressure was available from the pressure monitoring well SS-5 and the historical SS-25 well test data were available. As described in the Blade Report [1] pages 127 – 134, the well test data could have been used to determine the well deliverability based on the bottom hole pressure (BHP) to estimate the gas flow rate. The flow rate decreased with time because the field was being produced to reduce the BHP.
- October 23, 2015: While the size of the hole in the casing was unknown, the area of the casing × tubing annulus cross section could have been used as the size of the hole in the casing as a worst case (which in fact turned out to be correct because the 7 in. casing was parted).
- October 24, 2015: Kill attempt #1 reported gas at surface after pumping 89 bbl of fluid down the casing. This indicated a shallow leak as documented in the SoCalGas SS-25 daily report for October 24, 2015 [2] "At this time, It appears that we had a wellhead seal leak and/or a very shallow 7" production casing leak."
- November 8, 2015: A production log survey [3] (temperature, pressure, and spinner) was run and it showed cooling anomalies at approximately 365 ft and at 890 ft. Assumptions for modeling could have used these two depths as possible leak depths. The analysis from the temperature survey was dated November 12, 2015. As it turned out the leak was at 892 ft, the lower temperature anomaly depth. Blade modeled a leak at 440 ft and determined the

parameters to kill the well at a 440 ft leak were approximately the same as a leak at 892 ft [10] SS-25 Transient Well Kill Analysis, page 35.

- November 13, 2015: Junk shots were pumped during kill attempt #2. After 5 bbl of brine was pumped down the annulus, brine was observed from the fissures (Add Energy Report [4], page 89).

Blade believes that kill modeling using the well data described in Question 2 c. would have shown that the reported fluids pumped (volume, density, and rate) during kill attempts #2 through 6 would not have killed the well. A summary of the Blade analysis of the actual kill attempts are included in a supplementary report [10] *SS-25 Transient Well Kill Analysis*, page 20.

2.3 Question 3

3. Please refer to the following passage on page 13 of Mr. Abel's testimony, "Further, Boots & Coots' pumping operations were implemented not only in consideration of the pressure rating of the surface equipment, but also based on observation of the wellhead's physical response to pumping operations. Mr. Walzel described that during certain pumping operations, the SS-25 wellhead was "moving around a lot," which at times caused Boots & Coots to slow or stop pumping operations an [sic], in one case, broke the flow lines on the 7 inch tubing and casing, and the nipple on the wellhead. [Footnote omitted] While it does not appear that Blade's modeling accounted for these safety considerations, Boots & Coots appropriately tailored its kill operations—in real-time—to limit the potential risk of further damaging the well and compromising safety."

2.3.1 Questions and Blade Responses

a. Does Blade agree that Blade's modeling did not account for the considerations such as those identified above?

Blade's modeling assumed the fluids would be pumped at the rates, volumes, and density that would kill the well according to the kill modeling. It should be noted that any interruption in the planned pumping schedule such as slowing or stopping pumping will likely result in an unsuccessful kill attempt. Modeling results are the basis of pre-job planning. Safety considerations encountered during the kill attempts may interrupt and abort an attempt. However, the usage of heavier fluids, planned using the modeling results, may have reduced the well head movement.

Although requested, Blade did not have direct access to the Boots & Coots personnel to determine what Boots & Coots had considered and the rationale for kill operations. The 2018 Boots & Coots Examination Under Oath [8] did not have the details required to ascertain whether Boots & Coots considered all factors.

b. If not, did SoCalGas provide Blade with this information when Blade was doing its Root Cause Analysis?

Information that Boots & Coots appropriately tailored its kill operations—in real-time—to limit the potential risk of further damaging the well and compromising safety was not provided to Blade. As discussed in Question 1 e., Blade requested data regarding kill planning, modeling, and operations many times, but such data were not provided.

Safety considerations always take precedence when carrying out the field operations. The planning of a kill operation includes the modeling results to know how to plan the equipment, the personnel, the physical layout, and the fluids for the field operations. Safety considerations are

normally discussed at the pre-job meeting in the field. While the pumping is underway, changes in the plan can occur if things are not going according the plan or if there is a reason to change the operation because of a safety consideration. Events like wellhead movement and broken lines are reasons why the pumping plan could change.

It also needs to be pointed out that the modeling is based on an assumed pump rate and fluid density to maintain a bottom hole pressure because of fluid friction and, if the pump rate is reduced or stopped, the loss of friction pressure may allow the well to start flowing again. If this happens, the kill attempt is likely to be unsuccessful. The well, surface equipment, and pumping equipment need to be in a condition that allows the pumping operation to continue without interruption to have a chance of a successful kill. A review of data from kill attempts #2 through 6 reported no indications that safety issues would have compromised the ability to kill the well with heavier fluids at the pump rates resulting from the Blade modeling.

This shows the importance of using kill modeling, which considers the normal variables and accounts for other limitations, to provide results that maximize the chances of success to kill the well on the first attempt. The well and surface conditions are usually going to be the best for the earlier kill attempts.

c. If not, did Blade provide SoCalGas with the opportunity to provide Blade with this information when Blade was doing its Root Cause Analysis?

Blade made multiple data requests for data related to kill operations and kill modeling in addition to a request for a face-to-face meeting with the Boots & Coots personnel with first-hand knowledge of the SS-25 kill operations. A meeting with Blade and Boots & Coots could not be arranged. This was discussed in Question 1 e.

d. Provide any context necessary in support of these answers.

Blade data requests to SoCalGas related to killing the SS-25 well includes the following:

- Data Request February 11, 2016 [11]
- Data Request May 4, 2016 [12]
- Data Request June 29, 2018 [13]
- Data Request August 29, 2018 [14]
- Data Request October 26, 2018 [15]
- Data Request December 19, 2018 [9]
- Data Request January 2, 2019 [16]

2.4 Question 4

4. Please refer to the following passage on page 13 of Mr. Abel's testimony: "Second, Blade had the benefit of gathering more precise data points that were not available to Boots & Coots while planning, modeling, and executing its well kill attempts: 1) the precise depth and severity of damage to the production casing, and 2) the flow path of the gas from the 7" casing leak to the surface. Indeed, computer modeling is sensitive to the well geometry (i.e., leak depth, severity, and flow path), which means that more precise information will produce more accurate modeling outputs. However, precise flow path geometry is typically unavailable during an active leak response. . .While Blade was able to determine that the production casing had completely parted 892 feet after extracting and examining the

7" casing, Boots & Coots could only estimate the flow path geometry based on real-time observation and analysis of pumping operations. Second, after extracting the 7" casing, Blade had the advantage of using a video camera to analyze the 11-3/4" casing an observe holes—which Blade determined were the "likely consequence of the axial rupture" of the 7" casing. [Footnote omitted.]. The existence of holes in the surface casing is significant because it impacts the flow path of the leak and, in turn, the accuracy of the transient modeling. Accordingly, while Blade was able to extract the 7" casing to gather additional data to incorporate into its modeling, Boots & Coots could not have done the same. The practical impact of this disparity in information is that Blade's modeling was refined by additional data points that were not available to Boots & Coots." With this passage in mind, please answer.

2.4.1 Questions and Blade Responses

a. Does Blade agree that each of the points raised in this passage were available to Blade, but Boots & Coots could not have gathered such information at the time it was attempting the well kills of SS-25?

No.

b. If not, which data points does Blade view that Boots & Coots could have attained?

Assumptions regarding the leak path and leak depth were made within a few days of the leak event on October 23, 2015, and likely within hours because a wellbore schematic (WBS) with well details information was needed for kill planning. Examples of the evolution of wellbore schematics prepared post October 23, 2015, include wellbore schematics from SoCalGas, a Boots & Coots WBS from a December 16, 2015, presentation, a WBS from an Add Energy Report released in February, 2016, (work done prior to February), and a Blade WBS with final data. Log surveys run on November 8, 2015, were also available that indicated possible leak depths. A review of these documents shows there were no material changes to the leak path and there would be no impact on modeling results. Refer to Figure 3 through Figure 8.

Precise data of the leak location and leak path were not needed for transient kill modeling.

Figure 3 shows a rough sketch of SS-25 with an indication of the leak flow path to surface [17] (page 79, AC_CPUC_0000101). Figure 4 shows more details of the suspected gas flow path. The sketches indicate a leak in the 7 in. production casing with the leak path outside the 11 3/4 in. casing to surface [18].

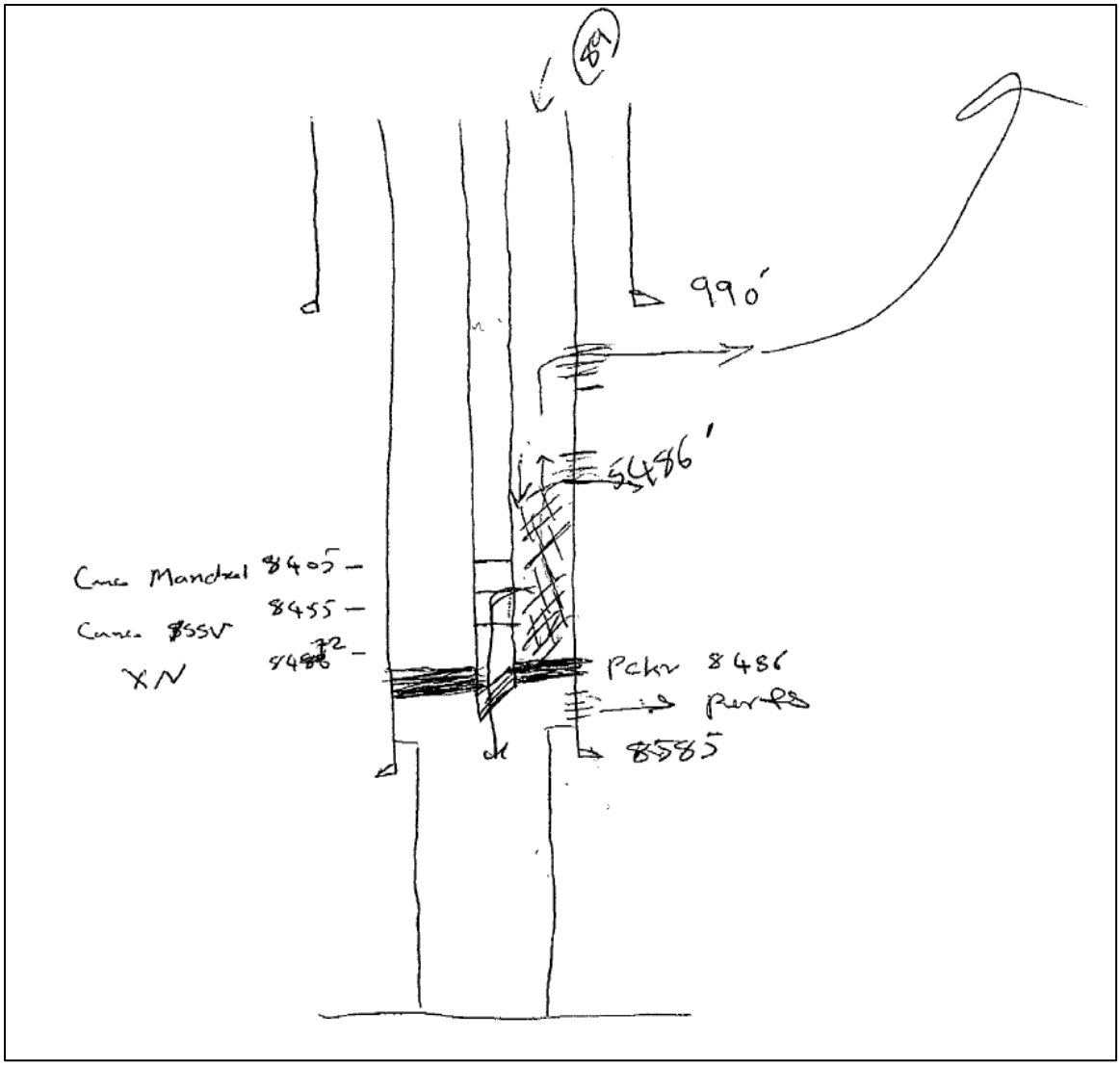


Figure 3: SoCalGas Wellbore Schematic of SS-25 (circa October 24, 2015)

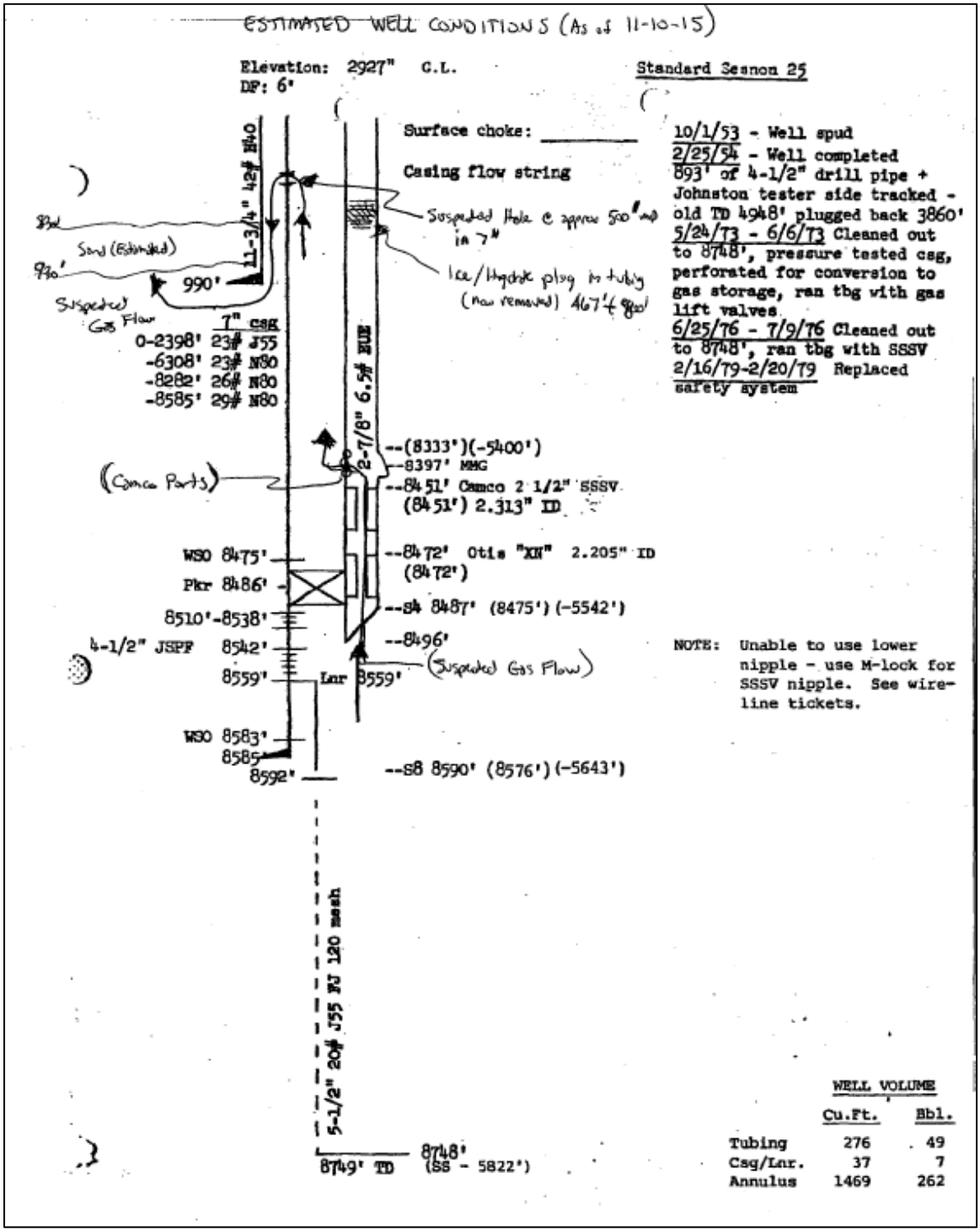


Figure 4: SoCalGas Wellbore Schematic of SS-25 (November 10, 2015)

On November 8, 2015, a production log including temperature, pressure, and spinner surveys was run [3]. It showed temperature anomalies with comments and a possible leak depth at 890 ft near the 11 3/4 in. shoe depth (Figure 5). The leak depth turned out to be correct and was confirmed when the casing was recovered.

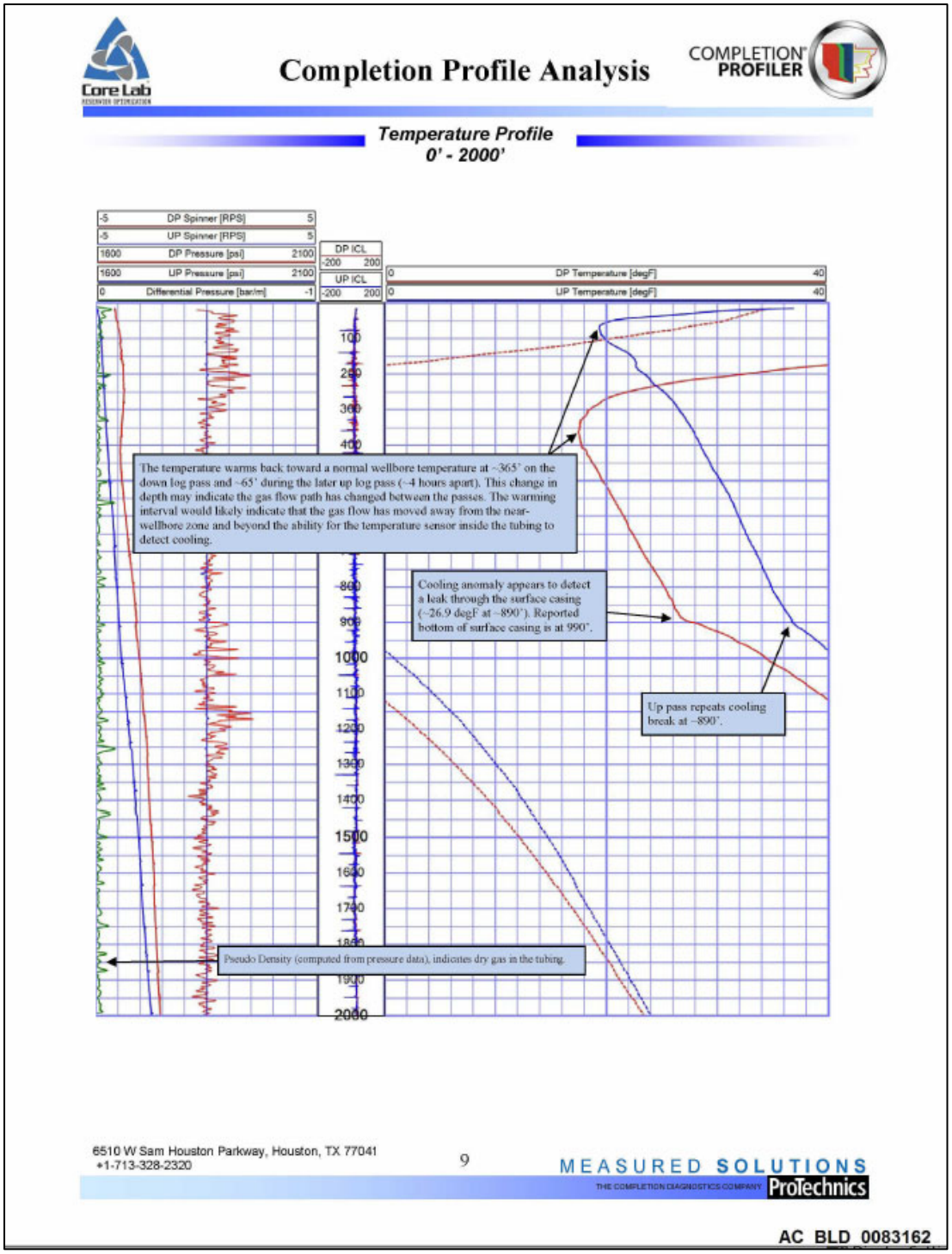


Figure 5: Temperature Profile (November 8, 2015)

Figure 7 shows the Boots & Coots version of the WBS with gas flow paths from a presentation dated December 16, 2015 [19].

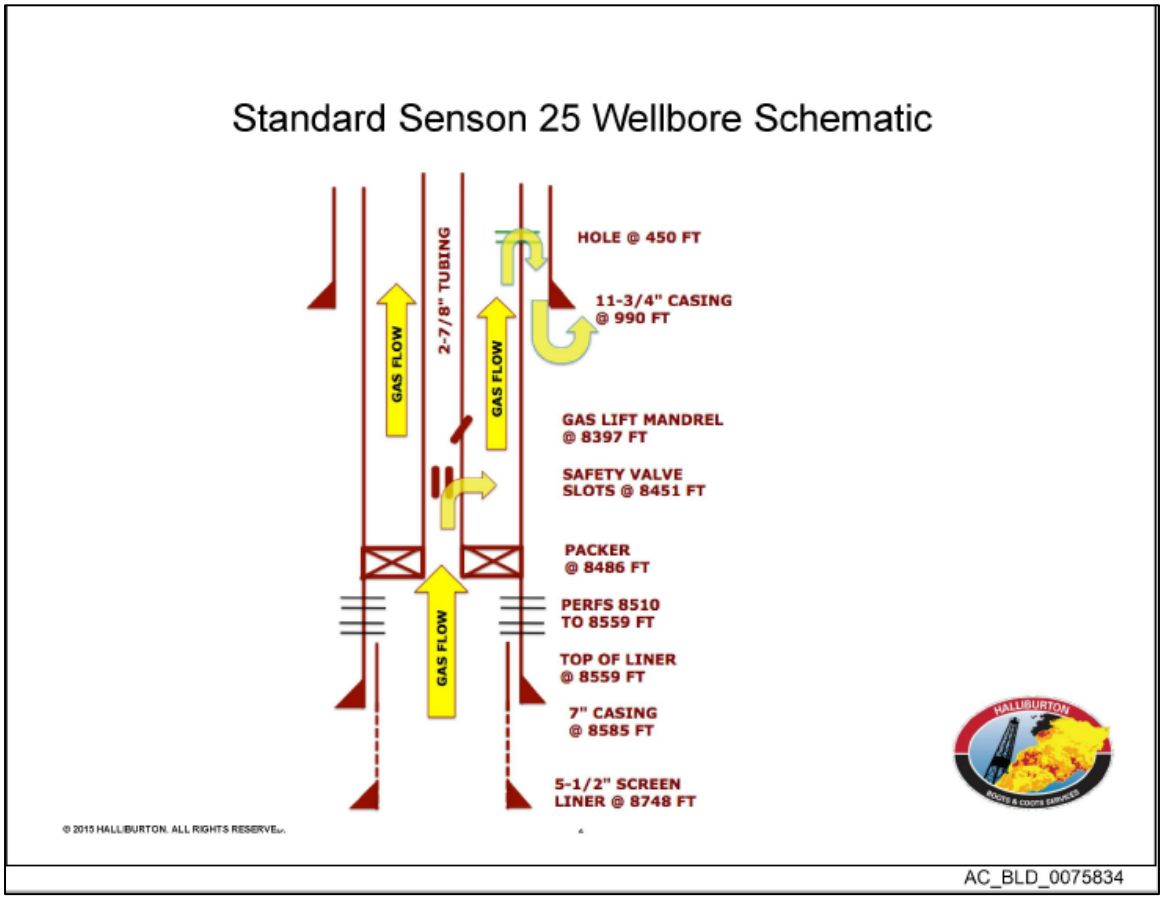


Figure 6: Boots & Coots Wellbore Schematic (December 16, 2015)

Figure 7 shows the WBS from the Add Energy Report released in February 2016 [4] (page 34, AC_BLD_0031337). The gas flow paths are indicated by the red arrows. A leak depth at 440 ft was estimated by Add Energy.

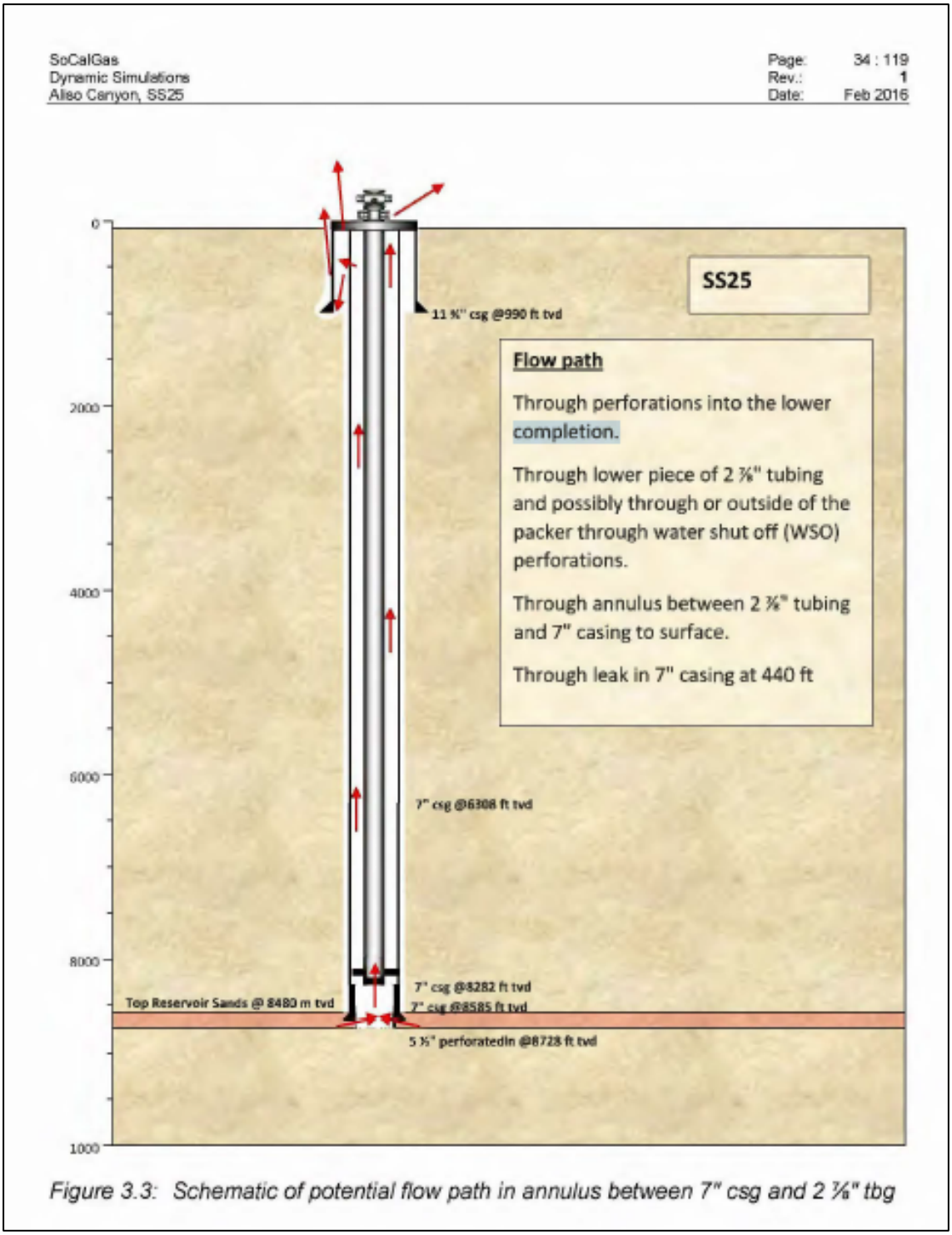


Figure 7: Add Energy Wellbore Schematic

Figure 8 shows the WBS for SS-25 prepared by Blade with the parted 7 in. casing at 892 ft.

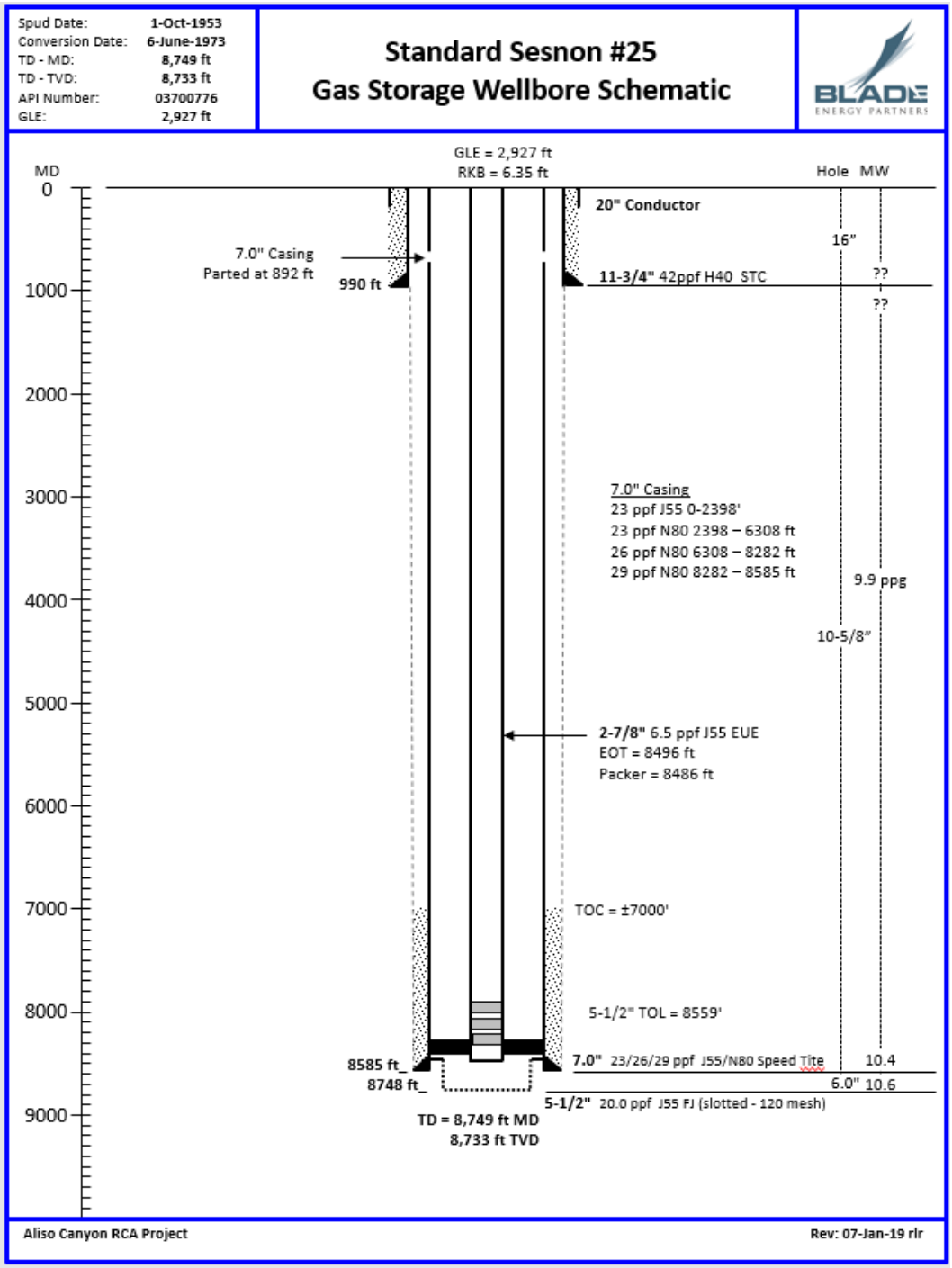


Figure 8: Blade Wellbore Schematic

An estimate of the depth of the leak was available from the temperature survey run on November 8, 2015 [3]. The survey showed temperature anomalies at 890 ft and 365 ft (Figure 5). Blade modeling shows flow from either depth resulted in no change in the pump rate and fluid density required to kill the well [10] *SS-25 Transient Well Kill Analysis*, page 35. The severity of the leak could have been assumed as the cross-sectional area of the casing × tubing annulus which turned

out to be correct with parted 7 in. casing. The flow path pressure restriction from the leak to surface was inferred by Blade based on the 7 in. casing surface flowing pressure of approximately 270 psi on October 23, 2015. The 7 in. casing flowing pressure takes into account the restrictions in the flow path to surface and the holes in the surface casing were not relevant.

The holes in the 11 3/4 in. casing were discovered in August 2018 after the 7 in. casing was extracted. The majority of the Blade kill modeling was done in 2016, some two years before the holes were discovered. The Blade kill modeling has never considered the holes in the 11 3/4 in. casing directly. The effect of the holes on the flow and pressure from the leak depth to surface is accounted for in the flowing casing pressure. The flowing casing pressure was known at the time of the event on October 23, 2015. Knowing the existence of the 11 3/4 in. holes was not relevant and was immaterial for the modeling.

The Add Energy Report [4] in 2016, had correctly predicted the flow path, ". . . the pressure in the outer annulus reached the fracture pressure of the 11 3/4" casing shoe with the consequence that flow paths were created outside of this casing to surface." (Add Energy Report page 9, AC_BLD_0031312) In the absence of any additional data, Add Energy had a near correct interpretation of the leak path, leak rates, and even the complexities of the hydrates forming. The Add Energy Report includes a discussion of potential flow paths (page 32, AC_BLD_0031335) where a possible shallow hole in the 11 3/4 in. casing is mentioned two times. Add Energy didn't have any of the benefits that Blade had with the actual physical failure, subsequent inspection and temperature logging data, nor any downhole video camera data. Notably, Add Energy estimated a flow rate 80 MMSCF/d at the time of the first kill attempt; they stated the methodology as, "(This estimated flow rate is not dependent of the flow path from the bottom of the tubing to surface, but only calculated based on pressures and the inflow performance relation (IPR) estimated from well tests)." (Add Energy Report page 7, AC_BLD_0031310). Add Energy's findings were not groundbreaking academic research but were an obvious extensions of industry standard modeling. Further, the Add Energy Report also assumed a shallow 7 in. casing leak location.

The knowledge of the exact 7 in. casing leak location and the presence of 11 3/4 in. holes does not impact the modeling. All of the required data was available during the kill attempts to conduct such modeling.

c. If Blade lists an answer to question 4b, explain why Boots & Coots could have attained these data points.

A key parameter required for kill modeling with realistic results, not mentioned in the passage, is the SS-25 gas flow rate. The gas flow rate, and the other data mentioned in Question 4 b. were available with reasonable certainty to conduct kill modeling. The data needed for modeling, including the estimate of the gas flow rate, a key parameter for kill modeling, are discussed in detail in response to Question 2 c.

d. In Blade's view, with the data that Boots & Coots had at the time it was attempting to kill well SS-25, could Boots & Coots successfully have killed well SS-25?

Yes, assuming that available data and reasonable assumptions had been used for the kill modeling (and assuming that the pumping was carried out according to plan developed through modeling), Boots & Coots could likely have killed SS-25. By "reasonable" we mean that assumptions were made based on engineering analysis, experience, and judgment. In addition, uncertainties in the input data should have been evaluated using the modeling to determine the sensitivities to a

given parameter. Conservative assumptions are normally made in designing kill plans to improve the chances for a successful outcome.

Blade evaluated each kill attempt using reasonable assumptions of bottom hole pressure and gas flow rate and modeling showed the well could have been killed with 12 ppg or 15 ppg drilling fluid pumped between 5 and 10 bpm depending on the specific kill attempt. The bottom hole pressure was changing with time, correspondingly, the kill parameters changed. Details of the kill scenarios are included in the Blade supplementary report *SS-25 Transient Well Kill Analysis* [10] (pages 27 – 31).

The Blade modeling planned killing the well with weighted drilling fluid which is better suited to prevent gas migration and leak-off into the formation than the low-density clear fluid that was used in kill attempts #2 – 6. Boots & Coots used 15 ppg drilling fluid in the final kill attempt #7 which was consistent with the Blade modeling results. This is discussed in the supplementary report SS-25 Transient Well Kill Analysis [10] (page 38).

e. If so, on which attempt?

Kill attempt #2 (the first Boots & Coots attempt) or kill attempt #3 were possible to achieve a successful kill assuming proper modeling was done with valid input data and a successful pumping operation according to the modeling results. This is discussed in the Blade Report [1] (page 4). A pumping operation with no interruptions is extremely important to prevent the well from flowing once it was killed during the kill operation. If the pumping fluid friction pressure is lost or reduced during the kill operation, the kill attempt will likely fail. It should be noted that operational uncertainties are not accounted for in modeling.

f. If the answer to Question 4 d is yes, why?

The well and site were in the best condition of all of the kill attempts for kill attempt #2. However, the SoCalGas November 13, 2015, daily report [2] shows there was a pump shut down during the job which interrupted the planned kill operation and resulted in an unsuccessful kill attempt.

Unfortunately, the surface conditions deteriorated during and after kill attempt #2. A quote from a DOGGR report [20] describes the damage caused by the kill attempt.

> Overall, this was the day that the well actually blew out in the conventional sense. Previously, it was not clear that the well was in a blowout situation. But after this pumping job, a blowout vent opened 20' from the wellbore and began shooting debris 75' into the air.

g. In Blade's view, with the data that Boots & Coots had and could have attained at the time it was attempting to kill well SS-25, could Boots & Coots successfully have killed well SS-25?

See Question 4 d.

h. If so, on which attempt?

See Question 4 e.

i. If the answer to question g is yes, why?

See Question 4 f.

2.5 Question 5

5. Please refer to the following passage of page 14 of Mr. Abel's testimony.

Lastly, Blade's model disregarded other key variables in pertinent well control operations. Blade's primary design variables were fluid density and pump rate. Other parameters such as viscosity, fluid stability, availability, and toxicity must also be considered. Further, not only must a kill operation stop the gas flow, the well must be stable when the kill fluid column is in a static state (i.e., after pumping stops). The pressure profile and corresponding tubular and wellbore integrity (which changes with depth) must also be considered and not exceeded. Because the Blade Report did not analyze these additional parameters, it is unknown if the fluid characteristics proposed by Blade (and alleged by SED) would have killed the well.

With this passage in mind, please answer:

2.5.1 Questions and Blade Responses

a. Does Blade agree that its model disregarded other key variables in pertinent well control operations?

No.

b. Why or why not?

The parameters fluid stability, availability, and toxicity are not input data to a kill model. Blade used fluid viscosity in the modeling analysis. Fluid viscosity is an important parameter used to estimate the friction pressure calculations which affect the pressure profile in the fluid flow path in the wellbore and the surface pump pressure.

c. Provide additional context and facts as necessary.

Fluid stability is important to ensure the solids in the weighted kill fluid (drilling fluid) remain suspended when the fluid is static. This would be a requirement that would be part of the specifications and requirements communicated to the supplier of the kill fluid when the fluid is ordered. The fluid properties would be confirmed before the fluid was pumped to ensure stability and other properties. This is a common requirement when dealing with fluids where the density is controlled by adding solids to the fluid.

Fluids with the proper density and flow properties are available from numerous suppliers. The kill fluids being discussed are also referred to as drilling fluid and are commonly used in oilfield drilling and workover operations. The fluid used by Boots & Coots in kill attempt #7 was 15 ppg water-based fluid that was procured and made available for the kill attempt. Blade identified similar densities for fluids for kill #2 through #6. A well kill model would have revealed that 12 ppg or 15 ppg fluid could have been used earlier in the kill attempts. As discussed in Question 4 d, using a drilling fluid as the kill fluid has several advantages over a clear fluid related to preventing gas migration and fluid leak-off into the formation.

Boots & Coots pumped barite pills as part of kill attempts #3, 4, and 5. However, because the well was not killed, the gas flow prevented the barite from settling and forming a competent plug or bridge in the annulus. A barite pill needs several hours in a static condition to settle.

It is not clear why toxicity is mentioned. It is not something that affects the modeling or the killing operations. Water-based fluids are commonly made up of non-toxic materials and there would be no reason to include toxic materials in a kill fluid.

d. Does Blade agree that "it is unknown if the fluid characteristics proposed by Blade (and alleged by SED) would have killed the well?

Yes, because the fluid characteristics along with the fluid densities and pump rates modeled by Blade were not used in a kill attempt and operational uncertainties are not reflected in modeling.

e. Why or why not?

The main parameter of the fluid used to kill a well is density with sufficient additives to maintain a stable fluid at surface and downhole conditions. The fluids proposed based on the Blade modeling included water-based fluids with 12 ppg or 15 ppg density and are standard-commonly available fluids with known flow properties.

f. Provide additional context and facts as necessary.

Not only are the fluid characteristics important; as discussed, the requirement for a successful well kill is to determine the fluid density and pump rate required to kill the well by stopping the influx of gas and then pumping the kill fluid in the same manner that it was modeled. If there are interruptions in the pumping, the kill is likely to be unsuccessful.

2.6 Question 6

6. Please refer to the following passage of pages 14 and 15 of Mr. Abel's testimony.

In sum, Blade's post-hoc transient modeling was an academic exercise that cannot fairly be compared to Boots & Coots' task of working on site under real-time constraints, and dealing with practical, field-level concerns (e.g., severe weather, wellhead condition, and safety of personnel). Even assuming Blade's transient modeling generated reasonable outputs, there is no basis for SED to claim that Boots & Coots should have killed SS-25 sooner—particularly as early as the second attempt (on November 13, approximately 3 weeks after the leak commenced)—when Blade needed 5-6 weeks to model a well kill, [Footnote omitted] not including time spent on the investigation and casing removal. Boots & Coots' approach of increasing pump rate and fluid density over well kill attempts 2 through 7 reflects a measured and logical process that did not compromise the safety in the process of bringing the well under control.

With this passage in mind, please answer:

2.6.1 Questions and Blade Responses

a. Does Blade view that its transient modeling generated reasonable outputs?

Yes.

b. Why?

Blade used available data (as described in the response to Question 2 c.) to construct its model. This model demonstrated that the well could be killed using 12 ppg or 15 ppg fluids pumped at reasonable rates.

c. Does Blade maintain that there is a basis for the claim that Boots & Coots should have killed SS-25 sooner?

Blade is not in a position to determine if Boots & Coots should have killed SS-25 sooner.

d. Why or why not?

As discussed previously, there are two components of a well kill required to result in a successful outcome. The first is a plan based on available data and reasonable assumptions if data is not available. Blade contends that because of the obvious complexity of the well control situation, kill

modeling was needed to develop a plan that maximized the chances of a successful kill. The second part is implementation of the pumping operations in the field. The fluid density and fluid pump rate have to match or exceed the plan and pumping must be completed without interruptions. When both components are done correctly, there is a good chance the kill will be successful. If either component is not right, a failed kill attempt is likely.

e. Does Blade maintain that there is a basis for the claim that Boots & Coots should have killed SS-25 as early as the second attempt, even if Blade needed 5 to 6 weeks to model a well kill (excluding investigation and casing removal time)?

The statement that Blade needed 5 to 6 weeks to model a well kill was taken out of context.

The accurate statement is "So for us [Blade] it took much longer; four, five, six weeks to analyze all of the seven kills." [21] (page 1058:14 – 16). Blade modeling included a detailed assessment of gas flowrates and history matching. This level of accuracy was not required for kill modeling prior to kill attempts.

Blade believes that more accurate kill modeling, using data available as early as the second kill attempt, would have led to a better well kill plan. Such modeling would have taken less than a week to complete. *Drillbench* software is intended to be used prior to well kill operations. A properly designed well kill plan, if implemented correctly, would have increased the chances of success. However, operational uncertainties are not reflected in modeling.

f. Why or why not?

See Question 6 d.

g. Even if Blade needed 5 to 6 weeks to model a well kill, does Blade maintain that Boots & Coots needed that long to do its own transient modeling at the time of the SS-25 incident?

No and again, the statement that Blade needed 5 to 6 weeks to model a well kill was taken out of context as discussed in Question 6 e.

h. Why or why not?

Blade is not in a position to know how long it would take Boots & Coots to do transient modeling. However, for engineers familiar with the *Drillbench* software could conduct such analysis with reasonable assumptions within a few days.

The data obtained by Blade for modeling was collected through numerous data requests over an extended time period.

i. Does Blade agree that Boots & Coots approach of increasing pump rate and fluid density over well kill attempts 2 through 7 reflects a measured and logical process that did not compromise the safety in the process of bringing the well under control?

Not necessarily.

j. If Blade disagrees with any portion of Mr. Abel's statement mentioned in question 6i, please identify each such portion.

Blade disagrees with the following portions of Mr. Abel's statement:

- "In sum, Blade's post-hoc transient modeling was an academic exercise that cannot fairly be compared to Boots & Coots' task of working on site under real-time constraints, and

dealing with practical, field-level concerns (e.g., severe weather, wellhead condition, and safety of personnel)."

- "Even assuming Blade's transient modeling generated reasonable outputs, there is no basis for SED to claim that Boots & Coots should have killed SS-25 sooner—particularly as early as the second attempt (on November 13, approximately 3 weeks after the leak commenced)—when Blade needed 5-6 weeks to model a well kill, [Footnote omitted] not including time spent on the investigation and casing removal."
- "Boots & Coots' approach of increasing pump rate and fluid density over well kill attempts 2 through 7 reflects a measured and logical process that did not compromise the safety in the process of bringing the well under control."

k. Please explain why Blade disagrees with each portion of Mr. Abel's statement identified in response to Question 6 j.

For the first bullet point of Question 6 j., see our answers to Question 1 b.

For the second bullet point of Question 6 j., see our answers to Question 6 e.

For the third bullet point of Question 6 j., our answer is as follows:

Based on kill attempt data and reports provided to Blade, the fluid density did not increase during kill attempts #2 through 6. The majority of the kill fluid pumped was 9.4 ppg brine and 8.34 ppg fresh water with some 18 ppg barite pills. This assertion is supported by Mr. Walzel with Boots & Coots. He stated ". . . I think the fluid weights stayed the same." in the *SED CPUC Opening Testimony Supporting Attachments* document [8] (page SED 00717:18 – 19). The fluid density did increase to 15 ppg for kill attempt #7. The data does show the pump rate increased from 8 to 9 bpm for kill attempts #2, 3, and 4 to 13 bpm for kill attempts #5 and 6. The pump rate for kill attempt #7 was 5.8 bpm.

As discussed in the Blade Report [1] (page 4), "Based on the data reviewed by Blade, the well-control company appeared to have designed the kill attempts solely by calculating a kill fluid density that was higher than the static bottom hole pressure." The result was that the well was not killed and the surface conditions continued to deteriorate. The well was brought under control in February 2016 from the relief well, not from top kill attempts in November and December of 2015.

l. Provide additional context and facts in support of the question 6 responses as necessary.

Not applicable. See the discussion in Question 6 a – k responses.

3 References

[1] Blade Energy Partners, "Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon SS-25," 2019.

[2] SoCalGas, "Daily Report 10-23-2015 thru 11-15-2015.pdf," 2015.

[3] SoCalGas, "SS-25 Completion Profiler, AC_BLD_0083154.pdf," 2015.

[4] Add Energy, "Dynamic Simulations Aliso Canyon SS25, AC_BLD_003304-AC_BLD_0031422, February 16, 2016 (C042 AC_BLD_0031304 Optimized Add Energy.pdf)".

[5] Blade Energy Partners, "SS-25 Well Nodal-Analysis with Uncontrolled Leak Estimation RCA Report Volume 3 - Post-SS-25 Leak Events.pdf," 2019.

[6] Unknown, "Kill Attempt Modeling, AC_BLD_0075832, (no date) (AC_BLD_0075832.pdf)".

[7] Unknown, "Kill Attempt Modeling, AC_BLD_0075853, (no date) (AC_BLD_0075853.pdf)".

[8] SED California Public Utilities Commission, "I1906016 (PUBLIC) SED Opening Testimony - Supporting Attachments.pdf".

[9] Blade Energy Partners, "Data Request December 19, 2018 (Request for Factual Data Verification Discussion December 19th, 2018-Boots_Coots.pdf)," 2018.

[10] Blade Energy Partners, "SS-25 Transient Well Kill Analysis RCA Report Volume 3 - Post-SS-25 Leak Events.pdf," 2019.

[11] Blade Energy Partners, "B012 RCA Info Request to SoCalGas, February 11th 2016.pdf," 2016.

[12] Blade Energy Partners, "B064 RCA Info Request to SoCalGas, May 4th 2016_additional kill data from SS25.pdf," 2016.

[13] Blade Energy Partners, "Request for Factual Data Verification Discussion June 29th, 2018.pdf," 2018.

[14] Blade Energy Partners, "RCA Follow-up Request to SoCalGas, August 29th 2018 Factual Meeting followup-1.pdf," 2018.

[15] Blade Energy Partners, "RCA Info Request to SoCalGas, October 26, 2018.pdf," 2018.

[16] Blade Energy Partners, "RCA Info Request to SoCalGas, January 2, 2019 final.pdf," 2019.

[17] SoCalGas, "SS-25 Well Documentation (from SoCalGas)_N.pdf".

[18] SoCalGas, "SS-25 Well Schematic_11-10-15.pdf," 2015.

[19] Boots & Coots, "Boots and Coots Presentation Dec 16 2015 AC_BLD_0075833.pdf," 2015.

[20] Division of Oil, Gas, and Geothermal Resources, "SS-25 Chronology Summary (STANDARD SESNON 25 Chronology Summary-1 from DOGGR.docx)".

[21] "Porter Ranch - FULL Deposition Transcript of Ravi M. Krishnamurthy, Ph. D., Vol. III, on 11-22-19 with EXHIBITS (00550786xBCD99).PDF," 2019.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-61 DATED APRIL 1, 2020)

SOCALGAS RESPONSE DATED APRIL 15, 2020

SoCalGas provides the following Responses to the Safety & Enforcement Division (SED) data request dated April 1, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

For this question set, Please refer to the document entitled, "Prepared Reply Testimony of L. William Abel on Behalf of Southern California Gas Company".

1. On page 2, refer to the statement that says, "I am familiar with Boots & Coots and believe they were fully qualified to perform well kill and relief well operations at SS-25." Regarding this statement, please answer:
    a. At the time they worked on well kill operations of Well SS-25, did Mr. Abel know any of the individuals who actually worked on those well kill operations?

b. If so, please list all such individuals?
c. Please explain how Mr. Able knows each of the individuals provided in response to question 1a.

Response 1:

SoCalGas objects to this request as vague and ambiguous as to "know" and unduly burdensome to the extent that it fails to identify the specific individuals that are the subject of the question. SoCalGas further objects to this request to the extent that it mischaracterizes Mr. Abel's testimony and assumes familiarity requires personal knowledge. Without waiving or limiting the forgoing objections, SoCalGas responds as follows.

a. Yes.

b-c. Among the Boots & Coots personnel who contributed to the SS-25 well control operations, Mr. Abel knows or was familiar with each of the following individuals prior to October 23, 2015:

- Jim LaGrone (professionally)
- Danny Clayton (professionally and personally)
- Rolly Gomez (professionally)
- Arash Haghshenas (professionally)
- Richard Hatteberg (professionally and personally)
- John Hatteberg (professionally and personally)
- Bud Curtis (professionally and personally)

Question 2:

On page 3, refer to the statement that says, "After Boots & Coots personnel arrived on site and were briefed by SoCalGas, Boots & Coots assumed primary control of the well control operations at SS-25; SoCalGas then monitored and managed Boots & Coots personnel in the manner that is generally accepted in the industry." Regarding this statement, please answer.

a. What exactly is "the manner that is generally accepted in the industry" to which Mr. Abel refers? Please explain.

b. Provide the documentation that shows that the answer provided in response to question 2a is the "manner that is generally accepted in the industry".
c. How does Mr. Abel know that "SoCalGas then monitored and managed Boots & Coots personnel in the manner that is generally accepted in the industry"? Please explain in detail.
d. Regarding the quoted statement in 2.c, did Mr. Abel observe SoCalGas's monitoring and management of Boots & Coots personnel at the time SoCalGas did it, or did he learn about it after it happened?

Response 2:

SoCalGas objects to this request to the extent that it mischaracterizes Mr. Abel's testimony by selectively quoting from Mr. Abel's testimony. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

a. Please see Mr. Abel's testimony at SoCalGas' Reply Testimony, Chapter III, pages 3-4:

> In all emergency well control operations, the customary role of the operator (here, SoCalGas) is to provide information about the well and reservoir, access to local resources common to the region, rapid procurement of necessary materials and services and, most importantly, coordinate with local authorities and regulators (e.g., CPUC, DOGGR) to allow the well control provider (Boots & Coots) to focus on the well kill. Here, consistent with industry practice, SoCalGas oversaw and approved Boots & Coots' recommended well control plans, but did not determine the manner in which Boots & Coots prepared or executed its well kill operations.
>
> ***
>
> In addition, as summarized, in part, in SoCalGas' Opening Testimony, SoCalGas acted prudently in response to the leak by, among other things:
>
> - Ensuring that Boots & Coots personnel had all information, equipment, contractors, and supplies necessary for Boots & Coots to do its job and execute its designed well kill plan;

- Promptly organizing and mobilizing pump-to-kill equipment to the site as quickly as feasible in a safe and efficient manner; the leak was discovered in the afternoon and the pump-to-kill was accomplished the next morning;

- Implementing a formal emergency response command and control system, and an Incident Command Structure per FEMA standards, so that the well control efforts could be managed in the most expedient manner possible (e.g., one senior Incident Commander with the authority to make critical decisions on the fly so the project could proceed without delay); and

- Maintaining site security and safety of all personnel involved and those in and around sensitive areas (i.e., "hot" zone), on a 24/7 basis.

b. Mr. Abel determined that SoCalGas monitored and managed Boots & Coots personnel in the manner that is generally accepted in the industry based on his more than 44 years of experience in the well control industry. Mr. Abel has participated in more than 500 well kill operations worldwide, and has personally designed and supervised well capping and kill operations for over 60 wells.

c. Mr. Abel determined that SoCalGas monitored and managed Boots & Coots personnel in the manner that is generally accepted in the industry after evaluating information he learned from, among other sources: prepared written testimony submitted in this proceeding, transcripts of several Examinations Under Oath conducted by SED of several SoCalGas and Boots & Coots personnel, live testimony of Boots & Coots personnel involved in the well kill operations, Daily Operations Report notes prepared by Boots & Coots, and responses to many data requests.

d. See Response to Question 2.c.

<u>Question 3:</u>

On page 3, refer to the statement that says, "In all emergency well control operations,

the customary role of the operator (here, SoCalGas) is to provide information about the well and reservoir, access to local resources common to the region, rapid procurement of necessary materials and services and, most importantly, coordinate with local authorities and regulators (e.g., CPUC, DOGGR) to allow the well control provider (Boots & Coots) to focus on the well kill. Here, consistent with industry practice, SoCalGas oversaw and approved Boots & Coots' recommended well control plans, but did not determine the manner in which Boots & Coots prepared and executed its well kill operations."

a. How does Mr. Abel know that SoCalGas oversaw and approved Boots & Coots' recommended well control plans?
b. Provide the well control plans that Boots & Coots recommended and that SoCalGas oversaw and approved.
c. Confirm that these are the same plans Mr. Abel saw when he made this statement.
d. Were Boots & Coots's recommended well kill plans based upon Boots & Coots's transient modeling?
e. If yes, did SoCalGas see the transient model prepared by Boots & Coots's that corresponded to each well kill plan?
f. If yes, identify each SoCalGas personnel member that saw the transient model prepared by Boots & Coots.

<u>Response 3:</u>

a. See Response to Question 2c.
b. See documents previously produced to SED with the following bates numbers: AC_CPUC_SED_DR_16_0000349 - AC_CPUC_SED_DR_16_0000360; AC_CPUC_SED_DR_16_0021452.
c. Confirmed.
d. Based on information and belief, SoCalGas understands that the kill plan summaries prepared by Boots & Coots were informed, in part, by the transient kill modeling that Boots & Coots conducted, beginning after Boots & Coots' second well kill attempt.
e. In the course of Boots & Coots' well control efforts, SoCalGas understood that Boots & Coots conducted modeling in connection with the SS-25 top kill operations. SoCalGas reviewed and discussed the kill plans with Boots & Coots, but SoCalGas did not review the model that may have informed the kill plans.
f. N/A.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-61 DATED APRIL 1, 2020)

SOCALGAS RESPONSE DATED APRIL 15, 2020

Question 4:

Please refer to the following passage of Mr. Abel on page 4 of his testimony:

"In addition, as summarized, in part, in SoCalGas' Opening Testimony, SoCalGas acted prudently in response to the leak by, among other things:
• Ensuring that Boots & Coots personnel had all information, equipment, contractors, and supplies necessary for Boots & Coots to do its job and execute its designed well kill plan;
• Promptly organizing and mobilizing pump-to-kill equipment to the site as quickly as feasible in a safe and efficient manner; the leak was discovered in the afternoon and the pump-to-kill was accomplished the next morning;
• Implementing a formal emergency response command and control system, and an Incident Command Structure per FEMA standards, so that the well control efforts could be managed in the most expedient manner possible (e.g., one senior Incident Commander with the authority to make critical decisions on the fly so the project could proceed without delay); and
• Maintaining site security and safety of all personnel involved and those in and around sensitive areas (i.e., "hot" zone), on a 24/7 basis."

With this passage in mind, please answer:

a. Does this passage have any factual basis other than reference to SoCalGas's Opening testimony?
b. If the answer to question 4a is yes, please provide the documentation showing such factual basis, including the point that basis supports.

Response 4:

SoCalGas objects to this question as unintelligible. SoCalGas further objects to this question as vague and ambiguous, particularly with respect to "any factual basis." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

a. Yes.
b. In addition to SoCalGas' Opening Testimony, please see SED Opening Testimony Exhibit, SED00635-00786 (Danny Walzel and James Kopecky, Examination Under Oath (Aug. 8, 2018), SoCalGas' Reply Testimony, Ex. III-4 (Danny Walzel Depo. (Feb. 21, 2020).); Boots & Coots' Daily Operations Reports; SoCalGas Daily Well Work Reports. These documents have been

previously provided to SED or are already in SED's possession.

Question 5:

Please refer to the following passage of Mr. Abel's testimony on page 5:

"Ultimately, based on the records I have evaluated and my extensive experience and expertise in well control operations, SoCalGas' leak response was prudent, reasonable, and consistent with industry practice. Further, SoCalGas displayed the necessary expertise to monitor and manage its well control experts."

a. Please provide the records Mr. Abel has evaluated to draw these conclusions in one seamless document, containing unique Bates numbers.
b. Of those records provided in response to question 5a, please highlight the specific passages in the records that Mr. Abel relied upon to draw the conclusions in this passage.
c. Did Mr. Abel review any records that led him to come up with a different conclusion than the one he drew in this passage?
d. If so, please provide the records, highlight the passages, and state the conclusion or conclusions each passage led him to draw.

Response 5:

SoCalGas objects to this request as vague and ambiguous, particularly as to the phase "one seamless document." SoCalGas further objects to this request as unduly burdensome to the extent that it requires SoCalGas to merge a voluminous set of records into a single document. SoCalGas further objects to this request as unduly burdensome to the extent SED's sole sponsoring witness, Margaret Felts, has already formed an opinion consistent with Mr. Abel's (see, Margaret Felts Depo. Tr. 150:3–151:11 (Feb. 5, 2020)). SoCalGas further objects to this request the extent SED mischaracterizes Mr. Abel's testimony; Mr. Abel's testimony was not informed by only a single document. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

a. Mr. Abel arrived at the referenced conclusion after evaluating a voluminous set of documents, which SoCalGas is still in the process of compiling; this response will be supplemented as soon as practicable with those documents. Responsive

documents that are already in SED's possession include the documents submitted with SoCalGas' Reply Testimony Chapter III (Abel) on March 20, 2020 and the SoCalGas Daily Well Work Summaries, previously produced to SED with bates numbers (AC_CPUC_0207880 – 0207979, AC_CPUC_0096441–0096630).

b. SoCalGas objects to this request as vague and ambiguous and unduly burdensome to the extent SED's sole sponsoring witness, Margaret Felts, has already formed an opinion consistent with Mr. Abel's (see, Margaret Felts Depo. Tr. 150:3–151:11 (Feb. 5, 2020)). SoCalGas further objects to this request on the grounds it seeks information that was already provided to SED.

c. SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the term "different" and unintelligible to the extent it asks whether Mr. Abel has formed an opinion contrary to the one expressed in the reply testimony he has sponsored on behalf of SoCalGas. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No.

d. N/A.

<u>Question 6:</u>

Please refer to the following passage of Mr. Abel's testimony on page 5: "As an initial matter, SED incorrectly assumes that a reasonable top kill attempt necessarily requires transient kill modeling. By way of background, there are two approaches for modeling a well kill: (1) steady state, and (2) transient. A steady state model consists of a set of equations based on the assumption that flow rate does not change over time (i.e., steady state). . . In fact, out of the more than 500 well control operations I have participated in during my career (approximately 90% of which were top kill operations), I have never relied on transient kill modeling for a top kill well control effort."

a. Provide the exact quote and page from SED's testimony that Mr. Abel relies upon to support his allegation that "SED incorrectly assumes that a reasonable top kill attempt necessarily requires transient kill modeling."
b. Is it Mr. Abel's contention that steady state modeling was appropriate for any of the top kill attempts of well SS-25 after October 22, 2015?
c. If the answer to question 6b is yes, please identify which ones, and the basis for such a contention.
d. Is it Mr. Abel's contention that no modeling was appropriate for any of the top kill attempts of well SS-25 after October 22, 2015?
e. If the answer to question 6d is yes, please identify which ones, and the

basis for such a contention.

f. Is it Mr. Abel's contention that transient kill modeling was not appropriate for any of the kill attempts of well SS-25 after October 22, 2015?
g. If the answer to question 6f is yes, please identify which ones, and the basis for such a contention.
h. Please provide all documentation in support of any basis Mr. Abel provides in support of any contentions provided in response to the subquestions of question 6.
i. Please identify Mr. Abel's qualifications with using transient modeling to do top kill attempts.

Response 6:

a. SoCalGas objects to this request as unduly burdensome to the extent it asks SoCalGas to identify aspects of SED's testimony to SED. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See SED's Opening Testimony, pp. 28-39. SoCalGas does not quote below the entirety of SED's testimony, but notes the following excerpt in which SED alleges a violation of PUC section 451 against SoCalGas for allegedly failing to conduct transient modeling for kill attempts two through six:

Given that SoCalGas had no well kill control plans and there are no data indicating transient modeling -- any modeling -- or analysis conducted to design the second through sixth well kill attempts, and such modeling would have provided the necessary information to successfully kill the well, SoCalGas violated Section 451.

The Section 451 violation began November 13, 2015, the day SoCalGas unsuccessfully executed the second well kill attempt without modeling, and continued through February 11, 2016, the date of the successful relief well kill attempt. Because the second through sixth well kill attempts should have been successful with proper modeling, shareholders should be required to pay all expenses associated with each one.

b. SoCalGas objects to this request to the extent it mischaracterizes Mr. Abel's testimony or assumes that modeling is required or appropriate for all top kill operations. Subject to and without waiving the foregoing objection, SoCalGas

responds as follows. Steady state modeling would not have been required in order to control the well SS-25.

c. SoCalGas objects to this request to the extent it mischaracterizes Mr. Abel's testimony. SoCalGas further objects to this question to the extent it is vague and ambiguous with respect to "which ones." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Question 6b.

d. SoCalGas objects to this request to the extent it mischaracterizes Mr. Abel's testimony. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Modeling would not have been required in order to control well SS-25.

e. SoCalGas objects to this request to the extent it mischaracterizes Mr. Abel's testimony. SoCalGas further objects to this question to the extent it is vague and ambiguous with respect to "which ones." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Question 6d.

f. SoCalGas objects to this request to the extent it mischaracterizes Mr. Abel's testimony. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Transient modeling would not have been required in order to control well SS-25.

g. SoCalGas objects to this request to the extent it mischaracterizes Mr. Abel's testimony. SoCalGas further objects to this question to the extent it is vague and ambiguous with respect to "which ones." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Question 6f.

h. SoCalGas objects to this question as unintelligible, vague and ambiguous, and overly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure.

i. SoCalGas objects to this request to the extent it seeks information that has already been provided to SED. Subject to and without waiving the foregoing

objections, SoCalGas responds as follows. Mr. Abel has participated in more than 500 well kill operations worldwide, and has personally designed and supervised well capping and kill operations in over 60 wells. For additional detail regarding Mr. Abel's experience and publications related to well control operations, please see Mr. Abel's curriculum vitae (SoCalGas Reply Testimony Chapter III (Abel), Ex. III-1). Mr. Abel's publications specific to modeling include: "Fire Fighting and Blowout Control", L. William Abel, et al, ABEL Engineering (Gulf Publishing), Chapter 12, Published Textbook, 540 pages, January 1994; "Planning a Dynamic Kill", L. William Abel, P.E., Abel Engineering, Journal of Petroleum Technology, Technology Today Series, SPE 36071, May, 1996; "Comparison of Steady State and Transient Analysis Dynamic Kill Models for Prediction of Pumping Requirements", IADC/SPE 35120, L. William Abel, SPE, ABEL Engineering Co. and Donald W. Shackelford, SPE, Halliburton Energy Services, Inc.

Question 7:

Please refer to the following passage of Mr. Abel, pp. 7 and 8.

Further, contrary to SED's assertions that Boots & Coots may have implemented its well kill attempts based on a flow rate that was too low (30 MMscf/D), as described in SoCalGas' Reply Testimony Chapter IV (Walzel/Haghshenas), Boots & Coots' transient modeling estimated and modeled gas flow rates ranging from 15-70 MMscf/d.

a. Please state how Mr. Able knows that Boots & Coots' transient modeling estimated and modeled gas flow rates range from 15-70 MMscf/d.
b. Has Mr. Able seen Boots & Coots's transient models that Mr. Walzel allegedly had stolen in late December, 2015?

Response 7:

a. Mr. Abel based his response on the testimony of Boots & Coots personnel. Please see SoCalGas' Reply Testimony Chapter III (Abel), Ex. III-4 (Danny Walzel Depo. Tr. 134:18-135:7 (Feb. 21, 2020)), and SoCalGas Reply Testimony Chapter IV (Walzel/Haghshenas) at 6.
b. No. As described in SoCalGas' Reply Testimony Chapter IV (Walzel/Haghshenas), Mr. Walzel's laptop was stolen from Mr. Walzel's vehicle

and never recovered. (See, SoCalGas Reply Testimony Chapter III (Abel) Ex. III-4 (Danny Walzel Depo. Tr. 77:1-78:14.)

Question 8:

Please refer to the following passages of Mr. Abel's testimony, page 16:

As it relates specifically to post-leak plans for relief well #2, SS-25A, and SS-25B, the relief well program developed for SS-25 was sufficient because the relief well plan for SS-25 was easily adaptable for relief well #2, SS-25A, or SS-25B. Given that the wells all share the same reservoir depths and intercept points relative to the reservoir, the relief well plan for SS-25 was adaptable to the other wells, with very minor modifications. Further, SED's proposal is inconsistent with industry standard.

With this in mind, please answer.

a. Please list all industry standards that show that SED's proposal is inconsistent with the industry standard.

b. Please provide all industry standards listed in response to question 8a, and provide the page number(s) relied upon, and highlight the text relied upon.

Response 8

SoCalGas objects to this request as overly burdensome, and to the extent that it mischaracterizes Mr. Abel's testimony by selectively quoting his testimony. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

a. Mr. Abel's testimony regarding the industry standard practices for relief well planning is based on his observations and practices over the course of more than 44 years of experience in the well control industry. Mr. Abel has participated in more than 500 well kill operations worldwide, and has personally designed and supervised well capping and kill operations in over 60 wells. As Mr. Abel noted in his reply testimony on behalf of SoCalGas, over the course of his extensive career in well control operations, he had observed only "one instance where well kill plans for neighboring wells were concurrently in place at the outset of a relief well operation." As Mr. Abel further states:

Even in that instance, I believed that it was unnecessary. That scenario

> was also distinguishable because the neighboring wells there were production wells, and the well control team was concerned with accidentally making contact with those wells while drilling the relief well. Here, SS-25A and SS-25B had already been hydrostatically controlled (respectively, on October 31, and November 1, 2015[] prior to commencing work on the relief well, so that concern did not apply.

(SoCalGas Reply Testimony, Ch. III (Abel), pp. 16-17.).

b. Please see response to Question 8a.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

Pre-Formal Inquiry into California Gas Management, Practices and Procedures Related To The Aliso Canyon Incident in October, 2015.

EXAMINATION UNDER OATH OF DANNY WALZEL and JAMES KOPECKY

CONFIDENTIAL

REPORTER'S TRANSCRIPT
San Francisco, California
August 8, 2018
Pages 1 - 152

Reported by: Doris Huaman, CSR No. 10538
Andrea Ross, CSR No. 7896
Shannon Ross, CSR No. 8916

1 **BEFORE THE PUBLIC UTILITIES COMMISSION**
OF THE
2 **STATE OF CALIFORNIA**

3
IN THE MATTER OF THE PRE-FORMAL
4 INQUIRY INTO CALIFORNIA GAS MANAGEMENT,
PRACTICES AND PROCEDURES RELATED TO THE
5 ALISO CANYON INCIDENT IN OCTOBER, 2015

6
Appearances:
7
(Examination Under Oath, August 8, 2018)
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1 **I N D E X**

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1 BE IT REMEMBERED THAT, by Consent of
2 the Witness, and on Wednesday, August 8,
3 2018, commencing at the hour of 10:10 a.m.
4 thereof, at the offices of the CALIFORNIA
5 PUBLIC UTILITIES COMMISSION, 505 Van Ness
6 Avenue, Room 4300, San Francisco, California
7 94102, before ANDREA L. ROSS, CSR No. 7896;
8 SHANNON M. ROSS, CSR No. 8916; and DORIS
9 HUAMAN, CSR No. 10538, personally appeared
10 **(DANNY WALZEL),**
11 called as a witness herein, who, being first
12 duly sworn, was thereupon examined and
13 interrogated as hereinafter set forth, and
14 **(JAMES KOPECKY),**
15 called as a witness herein, who, being first
16 duly sworn, was thereupon examined and
17 interrogated as hereinafter set forth
18 * * * * *
19 EXAMINATION
20 BY MR. GRUEN:
21 Q For starters, why don't we go
22 around the room and just identify your name
23 and spell your name, please, for the record.
24 We'll ask everyone to do it and then your
25 title and then the name of the entity who you
26 work for.
27 My name is Darryl Gruen,
28 D-a-r-r-y-l, G-r-u-e-n. I'm an attorney for

1 the Safety and Enforcement Division of the
2 California Public Utilities Commission.
3 MS. ROSE: My name is Julietta Rose,
4 J-u-l-i-e-t-t-a, R-o-s-e. I am a law clerk
5 for the legal division.
6 MR. BRUNO: My name is Kenneth Bruno.
7 I'm the program manager of gas safety branch,
8 Safety and Enforcement Division here at the
9 California Public Utilities Commission.
10 MR. SHER: Nicholas Sher, S-h-e-r, with
11 the Safety and Enforcement Division,
12 attorney.
13 MR. HOLTER: Randy Holter, R-a-n-d-y,
14 H-o-l-t-e-r. I work for the Safety and
15 Enforcement Division. I'm a senior utilities
16 engineer specialist.
17 MS. PENNINGTON-HILL: Kaitlyn
18 Pennington-Hill, K-a-i-t-l-y-n,
19 P-e-n-n-i-n-g-t-o-n hyphen H-i-l-l, attorney
20 for Halliburton.
21 MR. HELSLEY: Michael Helsley,
22 M-i-c-h-a-e-l, H-e-l-s-l-e-y, attorney at
23 Wanger Jones Helsley and an attorney for
24 Halliburton and Boots & Coots.
25 WITNESS KOPECKY: A James Kopecky,
26 K-o-p-e-c-k-y. I'm a well control specialist
27 for Halliburton, Boots & Coots.
28 WITNESS WALZEL: A Danny Walzel,

1 D-a-n-n-y, W-a-l-z-e-l, well patrol engineer
2 for Boots & Coots, Halliburton.
3 MR. GRUEN: Q Mr. Kopecky and
4 Mr. Walzel, thank you very much for being
5 here today. We appreciate that. We
6 understand that you're here voluntarily and
7 you're here with your counsel voluntarily. I
8 just -- I spoke with counsel off the record
9 and just wanted to clarify for the record, we
10 understand that what we discuss today, just
11 the actual points of discussion today, that
12 there's an agreement to keep that, keep the
13 points for the discussion confidential.
14 Counsel, did I capture that right?
15 MR. HELSLEY: Yeah, that's fine. I
16 agree with that.
17 MR. GRUEN: Okay.
18 MR. HELSLEY: Also, I just want to let
19 everyone know that SoCalGas, they were --
20 they helped bring the witnesses here today
21 and helped facilitate this. Just wanted to
22 let -- I just wanted to put that on the
23 record.
24 MR. GRUEN: Q Appreciate that. Thank
25 you. Let's see. With that, just a couple of
26 points of clarification before I turn it over
27 to Ms. Rose.
28 Gentlemen, Mr. Kopecky and

1 Mr. Walzel, do you have any concerns with
2 sharing information related to your work at
3 Aliso Canyon on well access 25 today?
4 WITNESS KOPECKY: A No.
5 WITNESS WALZEL: A No.
6 Q Do you have any interest in sharing
7 the information, sharing information related
8 to your work, on well access 25 today,
9 anything that you want to share with us?
10 WITNESS WALZEL: A What do you mean by
11 interest?
12 Q Is there anything that you want to
13 tell us from your work, related to your work?
14 WITNESS WALZEL: A Just your
15 questions.
16 WITNESS KOPECKY: A Yeah.
17 Q Okay, we'll move forward with the
18 questions absolutely, okay. With that,
19 Ms. Rose is going to ask you a little bit
20 about your background related to why you are
21 qualified to do what you did on well access
22 25. So with that, go ahead, Ms. Rose.
23 MS. ROSE: Thank you.
24 EXAMINATION
25 BY MS. ROSE:
26 Q So how would you describe what you
27 do in general at your job?
28 WITNESS KOPECKY: A You want to go

1 first, Danny?
2 Q Or individually if it's quite
3 different.
4 WITNESS WALZEL: A Yes, you know,
5 customers call us when they're having well
6 control issues and, you know, anything from
7 underground blow-outs to surface blow-outs to
8 circulating out of keg, you know, pressure
9 control, call us out to resolve the issue.
10 WITNESS KOPECKY: A As well control
11 specialist, I work under a broad direction of
12 the senior well control specialist typically
13 on any well control event, the types that
14 Danny mentioned.
15 Q Okay. So more kind of individual
16 issues versus just well interventions?
17 WITNESS KOPECKY: A We also do well
18 interventions.
19 Q Okay, thank you. How did you --
20 how did you become a well control engineer,
21 well control specialist? What kind of
22 training did you get?
23 WITNESS KOPECKY: A I have a -- prior
24 to joining Boots & Coots in 2004, I had a
25 20-year surface wellhead equipment
26 background.
27 Q Okay.
28 A And I work for Boots & Coots in

1 different capacities throughout the world on
2 different well control events. I joined the
3 well control group, I believe, five years ago
4 or six as a well control specialist.
5 WITNESS WALZEL: A I started at Boots
6 & Coots in 2002. I was hired after
7 graduating Texas A&M University with a
8 petroleum engineering degree and, you know,
9 and since then, I've worked in just about
10 every aspect of what Boots & Coots does.
11 I've been doing it for 16 years.
12 Q Okay. So you've worked there
13 before it was bought by Halliburton?
14 WITNESS KOPECKY: A Yes.
15 WITNESS WALZEL: A Yes.
16 Q Can you describe, if at all, how
17 the company has changed since Halliburton
18 acquired it?
19 WITNESS KOPECKY: A Pertaining to?
20 Q Your experience as an employee,
21 management, direction, just -- if nothing
22 comes to mind, then that's fine too.
23 A Well, there certainly have been
24 changes I can't really grasp, but I think
25 it's just, you know, it's being part of a
26 larger company.
27 WITNESS WALZEL: A Yeah, I would say
28 it's, you know, our day-to-day work we do in

1 the field hasn't changed.
2 Q Okay.
3 WITNESS KOPECKY: A I agree.
4 Q Okay, thank you. So you obviously
5 specialize in well control. Do you work on a
6 lot of gas well leaks in particular?
7 WITNESS WALZEL: A Yes.
8 Q About how many would you say you've
9 worked on in the past year?
10 WITNESS KOPECKY: A In the past year?
11 Q Yes, about, yeah --
12 A Well --
13 Q Yeah --
14 (Crosstalk.)
15 WITNESS KOPECKY: A Probably four.
16 Q Okay.
17 WITNESS WALZEL: A I've worked on one
18 gas blowout this year.
19 Q Okay. And where were they?
20 WITNESS KOPECKY: A Columbia.
21 WITNESS WALZEL: A Columbia.
22 Q Okay.
23 WITNESS KOPECKY: A Columbia,
24 Trinidad-Tobago, and can't recall. South
25 Texas.
26 Q Okay.
27 A And I don't recall if France was in
28 this year or just the end --

1 Q Okay, but --
2 A -- the end of last year --
3 Q Okay, but recently though?
4 WITNESS WALZEL: A Oh, you mean like
5 this calendar year?
6 Q Yeah or -- no, just the past year
7 give or take, you know.
8 A Trying to think of which ones I did
9 at the end of last year. Yeah, I can't
10 recall any gas leaks towards the end of last
11 year.
12 Q And how many of them, if any, were
13 like Aliso, like SS-25, maybe not in terms of
14 the longevity of the leak but, you know, the
15 way the well was.
16 WITNESS WALZEL: A Columbia was just
17 like it.
18 Q Just like it?
19 A Yes.
20 Q Okay. How so?
21 (Crosstalk.)
22 THE REPORTER: Excuse me, gentlemen, we
23 need to do this one at a time, please. Thank
24 you.
25 WITNESS KOPECKY: A As Danny was
26 saying and I interrupted him, it was a broach
27 to the surface.
28 MS. ROSE: Q Okay. Did it have a

similar kind of underlying geology as well?

WITNESS KOPECKY: A No.

WITNESS WALZEL: A No.

Q No, okay. Have you worked on many that had a similar underlying geology?

WITNESS KOPECKY: A Let me -- I'm going to clarify. When I said no about the geology, it was not a storage well.

Q Okay.

A Okay.

Q So they are actually just extracting the gas for the first time?

WITNESS KOPECKY: A I think the well was temporarily abandoned in Columbia, wasn't it?

Q Okay.

WITNESS WALZEL: A They weren't producing it at the time.

Q Okay. So going back to your background a little bit, would you say that you have some expertise at killing leaky wells?

WITNESS WALZEL: A Yes.

WITNESS KOPECKY: A Yes.

Q And what in particular makes -- kind of gives you that expertise versus, say, someone that manages a field?

WITNESS WALZEL: A I would say what --

1 just the -- a lot of what we do is, you know,
2 you gain the experience just from doing it.
3 Q Okay.
4 A We've learned from, you know, guys
5 that worked at Reddit Air for 30, 40 years,
6 you know, 50 years plus experience.
7 Q Yeah.
8 A You know, with our -- obviously the
9 petroleum background, engineering background,
10 and then learning it in the field.
11 Q Okay.
12 WITNESS KOPECKY: A And, yeah, I'd add
13 that's what differentiates us is quality of
14 our engineers.
15 Q The quality in terms of kind of
16 experience?
17 A Experience, yes.
18 Q Okay. Do you get specialized
19 training? Is it more that you just kind of
20 going along to jobs and eventually pick up
21 more understanding or anything?
22 A Well, and again, I'm not an
23 engineer but we do attend types of training,
24 a lot of it required. But you gain the most
25 experience not in the classroom but in the
26 field.
27 Q Okay.
28 WITNESS WALZEL: A Yeah.

1 Q Like working with people that are
2 more senior or just confronting your
3 problems?
4 A All the aboves, working with people
5 that have done it and going out and actually
6 doing it.
7 Q Thanks. And why would you say that
8 you and your colleagues that went to Aliso
9 Canyon for SS-25 were qualified to handle
10 that particular gas leak?
11 A Just the experience of having done
12 it before.
13 WITNESS KOPECKY: A I agree.
14 Q Have you ever testified in court
15 as, like, an expert witness or anything like
16 that?
17 WITNESS KOPECKY: A No.
18 WITNESS WALZEL: A No.
19 Q So for each of you, can you
20 describe the last well that you worked on,
21 kind of like what kind of well, where was it,
22 how did you make a decision about how to deal
23 with it, you know, what happened when you got
24 there, that kind of thing.
25 WITNESS WALZEL: A Well, the last one
26 I was involved with was in Columbia. It had
27 broke the surface. There was gas and oil,
28 water coming up 200 foot from the well. And

1 we -- it ended up -- it ended up bridging and
2 we got a snubbing unit and went in and set
3 cement plugs and --
4 Q I'm sorry, could you --
5 A So bridging with -- essentially the
6 well plugged itself off on its own.
7 Q Okay.
8 A It was making a lot of sand.
9 Q Okay.
10 A And plugged up with sand.
11 Q Okay. And how soon was that after
12 you got there?
13 A I don't know the exact date how
14 many days --
15 Q Yeah.
16 A -- but within a week, week and a
17 half it bridged when we started flowing it to
18 relieve the pressure.
19 Q Okay. And when you showed up,
20 what -- like, what did you do? Like, did you
21 ask for information, did you go survey the
22 well? Like, what's your thought process when
23 you got to that well?
24 A Well, they had provided drilling
25 records, you know, kind of a -- yeah, what
26 they were, you know, what they were planning
27 on doing, which was, I believe, put P and A
28 in the well, plug and abandon. We did a site

1 survey and we ordered out equipment to pumps
2 and, you know, kill fluids,
3 installed additional --
4 (Crosstalk.)
5 THE REPORTER: Excuse me, folks, I
6 can't take you both down at the same time.
7 Thank you.
8 WITNESS WALZEL: A Installed
9 additional valves on the wellhead, ordered a
10 snubbing unit from the US. And then as we
11 were just getting ready to rig up the
12 snubbing unit is when the well bridged. So
13 we used the snubbing unit to go in and clean
14 it out and set cement plugs.
15 MS. ROSE: Q Okay. And did you -- is
16 there kind of a -- when you get to the well,
17 and you say, okay, this is a well, it's
18 leaking, you know, it's a certain kind of
19 well, is there any kind of like formula that
20 you use or is it more just intuition? Like,
21 how do you decide what you're going to do?
22 WITNESS WALZEL: A Well, I mean, you
23 know, there's the formulas to figure out kill
24 fluids and volumes. And then a lot of it
25 is -- and we also ordered out wireline
26 equipment, you know. A lot of it is running
27 logs to, diagnostic logs, to find flow paths,
28 holes.

1 Q When you say diagnostic logs, are
2 those like past records or future --
3 A No, yeah, we get out there and run
4 them.
5 Q Okay.
6 A Typically it would be moist
7 temperature logs, gyros, spinner logs, you
8 know, those would be the main --
9 Q Okay.
10 A -- the main three that we run.
11 Q Okay. And then based on the
12 results of those, you decide --
13 A Right.
14 Q -- how you're going to approach the
15 well. Okay. Do you find it useful to talk
16 to the people that actually work on the field
17 who haven't dealt with the well in the past
18 or not so much?
19 A Yes.
20 Q Yes, okay. And what kind of
21 information would you ask them?
22 A You know, just drilling, you know,
23 well history --
24 WITNESS KOPECKY: A Formation
25 pressure.
26 WITNESS WALZEL: A Formation pressure.
27 WITNESS KOPECKY: A Tubular data.
28 WITNESS WALZEL: A Tubular data,

1 wellhead equipment, pressure ratings, stuff
2 like that.
3 Q Okay. And that's all -- that all
4 sounds like information you could also get
5 from a written record or not so often?
6 WITNESS KOPECKY: A Well, we --
7 although we may ask, we always ensure it's
8 going to be confirmed by written record --
9 Q Okay.
10 A -- if at all possible.
11 Q Okay. Okay. Okay. Thank you.
12 Could you describe the last well you worked
13 on.
14 A Well, I was on the well with
15 Danny --
16 Q Okay.
17 A -- in Columbia.
18 Q Okay.
19 A Participated in that. I don't
20 think I'm really -- I was in Trinidad-Tobago
21 on a well kill, but I don't think -- it was a
22 different situation and I don't think I'm at
23 liberty to --
24 Q Okay.
25 A -- because of confidentiality with
26 that client.
27 Q Okay. Is there a recent kill, well
28 kill, that you can talk about?

1 A The one prior to that would have
2 been Columbia.
3 Q Okay. Okay. Thank you. So the
4 one in Columbia, would you say that that was
5 kind of a standard or typical well kill?
6 A Well, it bridged itself.
7 Q It bridged itself. Is that normal?
8 WITNESS WALZEL: A Sometimes it
9 happens; sometimes it doesn't. Every well --
10 no two are the same when we show up.
11 Q Okay.
12 WITNESS KOPECKY: A As Danny said,
13 it's typically not typical.
14 Q Okay.
15 A What I mean by that is no two are
16 exactly the same. They're all unique
17 scenarios.
18 Q Are there any kind of criteria that
19 you would use that even just thinking about
20 it for yourselves to kind of group them like,
21 oh, this is a certain type or anything like
22 that?
23 WITNESS WALZEL: A Other than surface
24 blowout, underground blowout, broach, you
25 know.
26 Q Okay.
27 A That's how you can classify them --
28 Q Yeah.

1 A -- but then each one has its own
2 set of problems, you know, that you go
3 through the diagnostics and, you know,
4 there's no, you know, just every kill is
5 different.
6 Q Okay. Fair enough. When you show
7 up, are there any -- is there anything that
8 you do typically to either figure out what
9 you're going to do or first steps?
10 WITNESS KOPECKY: A First steps
11 typically when we show up in a well control
12 event is to ensure we secure the area, ensure
13 safety of personnel and accountability.
14 Q Okay.
15 A And then clear any hazardous
16 material from the area that could be the hot
17 zone, if you will, that could be impacted
18 such as fuel tanks or oxygen acetylene type
19 bottles, anything that could escalate the
20 situation.
21 Q Okay. And then what would you do
22 after that?
23 A Try to get an evaluation of the
24 situation.
25 Q Okay. And that would be through?
26 A Visual.
27 Q Visual, visual evaluation. And
28 does that actually really inform what you

1 choose to do next? I don't know, I mean I've
2 never been to a well.
3 A I mean it allows you to set your
4 zones, your exclusion zones.
5 Q What's an exclusion zone?
6 A Well, there are areas that you
7 don't allow any personnel in.
8 Q Okay.
9 A And then there's warm zones that
10 you can have personnel in viewing, preparing
11 to go into the hot zone or coming out,
12 exiting the hot zone. And then you've got
13 your areas that you can assemble equipment,
14 things of that nature.
15 Q Okay. So this is all kind of
16 securing the area safety. And then once that
17 kind of work is complete, how do you start
18 evaluating the well itself?
19 WITNESS WALZEL: A Well, like James
20 said, visual, can you see where the flow is
21 coming from, are we going to have access to
22 the wellhead, conditions of the wellhead. As
23 I said earlier, you can get access to the
24 wellhead, you know, are we going to be able
25 to put pump lines on it, rig up coil tubing
26 units, wireline units.
27 Q Coil what?
28 A Coil tubing, you know, equipment to

1 go in and do the well intervention.
2 WITNESS KOPECKY: A Remediate.
3 WITNESS WALZEL: A Remediate.
4 Q Okay. And then is this the time at
5 which you also runs those logs and maybe look
6 at a well history or is that later?
7 A Well, I mean if there's
8 information, then we'll review that.
9 Sometimes it takes a little while to run the
10 logs, you know, days or by the time you get
11 equipment, source the equipment, so, yeah,
12 look at the logs, order out equipment.
13 Q Okay.
14 WITNESS KOPECKY: A I agree.
15 Q Okay. And do you typically ask to
16 speak to any one kind of person or to see any
17 kind of record when you show up?
18 A Well, we would typically identify
19 the incident commander.
20 Q Okay. And what do you talk to them
21 about?
22 A Well, again, we don't own the well.
23 Q Yeah.
24 A But we're there to make
25 recommendations.
26 Q Uh-huh.
27 A So we would talk to him about what
28 they have in mind, you know, again, about

1 accountability of personnel, those type of
2 issues initially.
3 Q Okay. Is there anyone else that
4 you make it a priority to speak to?
5 WITNESS WALZEL: A Well, I mean just
6 each company, you know, if there's engineers,
7 geologists, just anybody that will have
8 information.
9 Q Okay, okay. And --
10 WITNESS KOPECKY: A And, again, just
11 for clarification, when I say we, we seek out
12 this individual, we talk to this individual.
13 A lot of times we're included in those
14 meetings. Sometimes we're not. It's done by
15 the senior --
16 Q Okay.
17 A -- personnel of Boots & Coots on
18 location.
19 Q Okay. And as far as records or
20 information that you look for when you show
21 up, is there anything that you typically look
22 for?
23 WITNESS WALZEL: A I think we've
24 already --
25 Q Yeah.
26 A Well history --
27 Q Well history, okay.
28 A Tubulars.

1 Q Okay, okay. I just want to make
2 sure.
3 A Yes.
4 Q Okay, thank you. I think I'm good.
5 MR. GRUEN: Thank you, Ms. Rose.
6 EXAMINATION (resumed)
7 BY MR. GRUEN:
8 Q Appreciate that. Thanks for that.
9 A couple things just to follow up on. I take
10 your point that each incident is different.
11 What I heard earlier, too, is that there's
12 some similarities between Columbia, what
13 happened in Columbia, and then what happened
14 in SS-25.
15 I think you had mentioned that one
16 was -- that those were a surface breach. So
17 to that point, they were similar.
18 WITNESS WALZEL: A Similar, yeah.
19 Q Even though I'm sure there were
20 lots of differences, too, to your point. So
21 just walking through that, is -- and then the
22 bridging in Columbia would have been
23 different --
24 A Right.
25 Q -- than SS-25. What else between
26 Columbia and SS-25, if anything, was similar?
27 A That there was a broach to surface.
28 That was pretty much all that was similar.

1 WITNESS KOPECKY: A I think that's the
2 only similarity.
3 Q Okay, thank you. All right, so
4 just to talk a little bit about -- I'm going
5 to ask you to maybe, if you can as best you
6 can, and I know it's three years ago
7 approximately so it's been a little time and
8 I'll work with you to help try and jog your
9 memory if you can't remember.
10 I think most people might -- their
11 memories might start to fade about what
12 happened three years ago so I get that. But
13 having said that, to the best you can, what
14 I'd like to ask you to do is give us an
15 understanding of in your experience from when
16 you first started, when you first learned
17 about SS-25 and the incident there, to give
18 us as best you can a timeline in your
19 experience of what happened including how you
20 learned, and then the different well kill
21 attempts that you had.
22 I recognize that's really broad.
23 It may take a little bit of time to do that.
24 So just maybe if we could start kind of at
25 the beginning sort of and I'll ask questions
26 about how you learned and if we could walk
27 forward in time from there to when you
28 finished up, so I'll -- this is just kind of

1 a high point. I'll start to ask questions
2 about that.
3 But I just wanted to kind of give
4 you an idea up front to where I'm going on
5 this. So maybe with that, if you could, as
6 best you can remember, approximately when --
7 and I'm not going to hold you to the exact
8 date -- but approximately when did you first
9 learn about the incident, did each of you
10 learn about the incident at SS-25?
11 A Well, I'll begin. I won't be --
12 unfortunately I won't be able to get very far
13 with the timeline.
14 Q Okay.
15 A But I initially -- I took the phone
16 call for the SS-25 at approximately by memory
17 8:00, 8:30 Houston time. And I conferred
18 with the gentleman that had phoned me with
19 SoCal. We determined that we were going to
20 need to mobilize. I contacted my employer
21 or, excuse me, my direct supervisor, the well
22 control manager, and we determined that we
23 would send the senior well control
24 specialist, a well control engineer, and
25 myself initially.
26 Q Okay.
27 A And we departed on the first
28 available commercial flight the next morning

1 early because we did look into a charter, but
2 we wouldn't have been able to address
3 anything in the dark hours and we arrived as
4 early as possible so the charter wasn't
5 beneficial.
6 Q And just a couple clarifications
7 about that. When you said 8:00 to 8:30, was
8 that in the morning or the evening?
9 A Oh, evening, I'm sorry, p.m., yes.
10 Q That's okay. Do you remember who
11 the gentleman was at SoCalGas who called you?
12 A I don't recall exactly but I do
13 recall it was a gentleman by the name of Todd
14 Van Putte maybe.
15 Q Van de Putte?
16 A Maybe, something.
17 Q Okay, that's helpful. And do you
18 remember how soon after the incident that
19 phone call happened?
20 A No, I do not remember.
21 Q That question suggests I'm asking
22 you to be precise for three years ago and I'm
23 not, so let me just clarify. Would it have
24 been within hours or days after the incident
25 first happened?
26 A My recollection it would be hours
27 maximum.
28 Q Hours maximum. That's helpful.

1 Okay, thank you. And so then you would have
2 taken a charter then or you did take a
3 charter the day -- the morning after the
4 incident happened?
5 A We flew commercial in the morning.
6 Q Flew commercial the morning after
7 the incident happened?
8 A Correct.
9 Q Okay, I follow. Thank you. And
10 when you talked about the different -- I
11 think you mentioned a well control manager
12 and a well control specialist. You decided
13 that certain personnel should come out.
14 Which individuals were those?
15 A A senior well control specialist,
16 myself, and Danny.
17 Q And what was the name of the senior
18 well control specialist?
19 A Danny Clayton.
20 Q Danny Clayton, thank you. Okay.
21 And so when you first were on the phone --
22 actually let me -- so you get out to Aliso
23 Canyon field after the charter. Am I
24 following that right? You went right to the
25 field?
26 A Yes, we did.]
27 Q What was the first thing you did
28 when you got to the field?

1 WITNESS KOPECKY: A Again, I recall --
2 and, again, I'm going by memory. I recall we
3 attended a briefing.
4 Do you agree, Danny?
5 We attended a briefing prior to
6 going to the wellsite on Aliso Canyon, the
7 briefing on the current situation and safety
8 concerns.
9 Q Okay. And the way I'm asking is --
10 I appreciate that if you want to jump in at
11 any time. I'm asking -- I'm looking at
12 Mr. Kopecky, but it's really directed to both
13 of you, so feel free to jump in.
14 WITNESS WALZEL: A Okay.
15 Q So when you talk about the safety
16 concerns, do you remember what specifically
17 they were -- what was discussed at that
18 meeting?
19 WITNESS KOPECKY: Of course, we weren't
20 really aware because we hadn't seen the well,
21 but the safety concerns to our knowledge, or
22 that were communicated to us was methane gas
23 leak.
24 Q Okay. Anything else?
25 A And not for health reasons, but for
26 as an ignition, possible source.
27 Q I see. Okay. So that the surface
28 breach, was it identified as a surface breach

1 at that point?
2 WITNESS WALZEL: A Yes. I mean --
3 WITNESS KOPECKY: A Yeah. That was
4 the reason for the phone call, the initial
5 call.
6 Q Got it. Got it. So the initial
7 phone call would have identified the surface
8 breach, and due to the surface breach then
9 there was concern about ignition, there was
10 enough gas being released into the
11 atmosphere, there were concerns about
12 ignition?
13 WITNESS WALZEL: A Anytime there's
14 gas, you know, whether it's a little or
15 any -- it's always a --
16 Q I follow. Thank you.
17 WITNESS KOPECKY: A Right.
18 Q Let me back up to what else on the
19 phone call -- what were the things identified
20 on the initial phone call to you that made
21 you say, Hey, we better get out there.
22 WITNESS KOPECKY: A The fact that
23 there was a broach to surface.
24 Q Okay.
25 A Ever slight as it may have been at
26 the time, there was still a major concern.
27 Q Okay. After the safety meeting,
28 what -- so they had identified the surface

1 breach to you. Did they -- did either in the
2 phone call or the safety meeting, can you
3 describe more the problem that they had
4 described to you.
5 WITNESS WALZEL: A I mean, it was, you
6 know, there's a gas, you know, release and
7 then we went and looked at it, you know, and
8 did an observation of the well, and, you
9 know -- you know, I mean, they just
10 described, you know, what they last saw up
11 there, and we went and looked at it and
12 confirmed it.
13 Q So you observed what they had told
14 you?
15 WITNESS WALZEL: A Right.
16 Q Did you observe anything different
17 than what they told you?
18 A No.
19 WITNESS KOPECKY: No.
20 Q What did you observe up there?
21 WITNESS WALZEL: A Well, we went and
22 looked at it and, you know, there was - there
23 was an asphalt pad on location, you know,
24 around the well, and I recall there was a
25 couple cracks in the asphalt, and you could
26 see gas fumes coming up out of it.
27 Q Okay. And were you both there when
28 you went up to see the condition?

1 WITNESS KOPECKY: A Yes. And as Danny
2 mentioned, you could see the gas. You had
3 to -- you had to really look. There were
4 small fissures, cracks, and then it wasn't
5 any major discharge visually at that time.
6 Q Okay. I think you had talked about
7 doing an evaluation after doing a visual.
8 That's kind of one of the common things you
9 mentioned to Ms. Rose is what you do -- what
10 you've done commonly.
11 So at what point did you do your
12 evaluation on SS-25?
13 WITNESS WALZEL: A First day. As soon
14 as we got there.
15 Q What did you do as part of your --
16 what did you do as your evaluation on SS-25?
17 WITNESS WALZEL: A Went and looked at
18 the well and looked at the site.
19 Q What did you decide in terms of --
20 what did you find? And what did you think
21 had to be done as a result of your
22 observation?
23 WITNESS KOPECKY: A That the well
24 would have to be killed.
25 Q So let's go through the well-kill
26 attempts. And I understand there are a few,
27 and if we can -- you know, I think there
28 were -- my understanding was there were a

1 number of them. So I'd like to just
2 walk-through, as best you can remember, the
3 different well-kill attempts.
4 So after you first got there, can
5 you talk about the first well-kill attempt.
6 WITNESS WALZEL: A Yes. I mean, yeah,
7 we, you know, we ordered out equipment -
8 pumps, pump iron, choke manifolds, you know -
9 got all the unnecessary equipment off
10 location, and we pumped down -- we lined up
11 to pump down the tubing, and I can't -- I
12 can't recall the specifics of how -- how much
13 we pumped. You know, we set the -- I believe
14 all the wellhead equipment was 5,000 PSI
15 pressure rating. So we set a safety limit
16 somewhere around 4,300 pump PSI, and we
17 pumped on it, and -- but I couldn't tell you
18 how many barrels, but we deemed that it was,
19 you know -- we shut down to regroup and talk
20 about it because it wasn't, you know, going
21 as expected.
22 Q How did you decide how many barrels
23 to pump and what PSI you were going -- what
24 pressure you were going to use in order to
25 pump them and all that stuff?
26 WITNESS WALZEL: A Right. So,
27 obviously, the faster you pump, the more
28 pressure you're going to have.

1 Q Uh-huh.
2 WITNESS WALZEL: A So we tried to pump
3 as fast, you know -- see what we could pump
4 before we exceeded the safety limit and
5 pressure and then -- but like I said, I can't
6 recall how many barrels we pumped or when we
7 shut down or I don't remember -- I don't
8 remember the specifics of how many barrels we
9 pumped.
10 MR. BRUNO: May I jump in real quick?
11 MR. GRUEN: Sure. Okay.
12
13 EXAMINATION
14 BY MR. BRUNO:
15 Q Mr. Walzel, and Mr. Kopecky, I want
16 to back up just a bit, and I want to get a
17 few clarifications before we get to the first
18 well-kill attempt.
19 When you could see fissures, could
20 you also smell gas; do you recall? Could you
21 smell the odorant?
22 WITNESS WALZEL: A I can't remember if
23 I could smell it, or, you know, I remember it
24 was windy; so, you know, I can't recall if I
25 could smell it or not that day.
26 WITNESS KOPECKY: A I'm in agreement
27 with Danny. As a matter of fact, now that he
28 mentions it, which you're all probably aware,

1 it's typically windy at all times up on the
2 mountains there, apparently.
3 I don't recall any memory of
4 smelling any -- I forget what the additive is
5 called.
6 Q Yes, sir. I understand.
7 What about the concentration of
8 gas; when we're first seeing the gas coming
9 through the fissures, was that a
10 concentration of gas that was explosive, or
11 do you recall?
12 WITNESS KOPECKY: A I don't recall.
13 We work a lot in 90, 100 percent LEL. It
14 didn't seem to be a large concentration of
15 gas. It -- we weren't concerned with the
16 ignition in the immediate area, especially
17 with the wind.
18 Q And by 90 percent LEL, you mean you
19 weren't quite at the lower explosive limit?
20 WITNESS WALZEL: No.
21 WITNESS KOPECKY: No. No. I say we
22 work in those environments all the time, and
23 with my experience, this wasn't an explosive
24 environment when we initially went up to
25 observe.
26 Q Yes, sir. Thank you. Thank you
27 for that. Would you consider -- if I use the
28 term "blow-out," does that mean anything to

1 you?
2 WITNESS KOPECKY: A Certainly.
3 WITNESS WALZEL: A Yeah. I mean, the
4 definition of a "blow-out" is an uncontrolled
5 flow or release --
6 WITNESS KOPECKY: A To the atmosphere.
7 WITNESS WALZEL: A -- or underground.
8 Q So at the time of the phone call,
9 am I understanding, it was already a blow-out
10 at that point?
11 WITNESS KOPECKY: A Whenever it
12 broached the surface.
13 WITNESS WALZEL: A Correct.
14 Q Thank you for that. I just have
15 one more.
16 You mentioned the incident
17 commander is one of the first things you do
18 around the safety meeting. Had you met the
19 incident commander at that point?
20 WITNESS KOPECKY: A I don't recall.
21 I'm familiar with the incident commander. We
22 met a lot of people upon arrival. I don't
23 recall who the incident commander was at that
24 time. At that time. At that particular
25 time.
26 Q But do you recall meeting an
27 incident commander?
28 WITNESS KOPECKY: A Yes -- no, I don't

1 know that I met him on the first day because
2 I don't recall there was so many titles,
3 meeting a lot of people. We were concerned
4 with getting a chance to look at the well,
5 but, no. I did meet an incident commander
6 throughout the job thereafter.
7 Q Yes, sir. And then, if I
8 understand, I'm just going back to
9 decision-making. Did I understand you
10 correctly that the incident commander makes
11 decisions, but you guys are providing the
12 recommendations? Did I pick that up
13 correctly?
14 WITNESS KOPECKY: A I think broadly,
15 yes. Again, what I stated earlier is that we
16 don't -- typically, and I'm referring to
17 other jobs as well, when we go on location,
18 we don't take control, if you will.
19 We're governed, if you will, by
20 whomever the customer representative is.
21 We're there to make recommendations, and they
22 know that that is our expertise.
23 Q Yes, sir. Okay. I'm going to
24 throw out a name and just to the best of your
25 recollection, just kind of trying to identify
26 the incident commander. Does the name Jimmy
27 Cho jog any memory?
28 WITNESS KOPECKY: A I recall meeting

1 Jimmy.
2 WITNESS WALZEL: A Yes.
3 Q Do you think he may have been the
4 incident commander?
5 WITNESS WALZEL: A Well, initially --
6 I don't recall, but the incident commander
7 throughout the majority, you know,
8 throughout -- what I believe was Bret.
9 WITNESS KOPECKY: A Correct.
10 Q By Bret, do you mean Bret Lane?
11 WITNESS KOPECKY: Yes.
12 WITNESS WALZEL: Yes. I couldn't
13 remember his last name.
14 Q So he was in the capacity of -- by
15 "he," I mean Mr. Lane. He was in the
16 capacity of either being incident commander
17 or making decisions?
18 WITNESS WALZEL: Yes.
19 WITNESS KOPECKY: I'm assuming -- not
20 assuming. I know his entire team.
21 MR. BRUNO: Q Yes, sir. Understand.
22
23 EXAMINATION (resumed)
24 BY MR. GRUEN:
25 Q As incident commander with his
26 team, Bret Lane was making the final
27 decisions about how to proceed on the
28 well-kill attempts.

1 WITNESS KOPECKY: A I don't know that
2 to be fact.
3 Q Okay. Would you make
4 recommendations to Bret Lane and his team
5 about how to proceed well-kill attempts?
6 WITNESS WALZEL: A Yes.
7 Q Were the recommendations followed?
8 WITNESS WALZEL: A Yes. Well, yeah.
9 Q Any changes that they made to the
10 recommendations?
11 WITNESS WALZEL: A I mean, I can't
12 remember if there was, you know, any changes
13 off the top of my head right now.
14 Q Do you remember any personnel from
15 SoCalGas who talked the recommendations
16 through with you before you made them with
17 Mr. Lane's team?
18 WITNESS KOPECKY: A I was not involved
19 in the meetings with any of the
20 recommendations.
21 WITNESS WALZEL: Yes. I mean, I was --
22 typically, I would be, like, present at the
23 morning meeting, and, you know, like I said,
24 our team was in the meetings. You know, I
25 mean, it was kind of, you know, meet in the
26 trailer, talk about what we would like to do,
27 and come up with a formula and go out and do
28 our pump job.

1 Q Who was your team leader?
2 WITNESS WALZEL: A His name was Danny
3 Clayton.
4 Q Danny Clayton, yeah.
5 And so how would you come up with a
6 recommendation to SoCalGas?
7 And when I ask, I mean, did you
8 come up with a recommendation among the Boots
9 & Coots team first, and then present it to
10 SoCal?
11 WITNESS KOPECKY: A I don't believe --
12 I wasn't involved in strategy.
13 Q Okay.
14 WITNESS WALZEL: A Yeah, I mean, you
15 know, let's try to pump on it and rig up a
16 pump on it, and, you know, with the
17 kill-weight fluids, and, you know, make an
18 attempt at trying to kill it.
19 Q And that was a conversation you had
20 with Danny Clayton to figure that out?
21 WITNESS WALZEL: A Yeah. I mean,
22 really, when we got there, that was the
23 first, you know -- you know, we got to pump
24 on it to kill it.
25 Q Right. Right. Yeah. So I'm
26 following you on the strategy of how to do
27 it. I'm just trying to get at who was kind
28 of in the -- who you talked to first in order

1 to figure out how.
2 A I can't -- I don't remember who I
3 talked to first.
4 Q Okay. Okay. Someone within Boots
5 & Coots first or was it kind of an overall
6 meeting with SoCalGas and Boots & Coots to
7 figure out how to do it?
8 A Well, you know, it was always kind
9 of overall, you know, group, you know,
10 discussion.
11 Q Okay.
12 A Weigh out pros and cons and
13 consequences to come up with the best plan.
14
15 EXAMINATION
16 BY MR. BRUNO:
17 Q Mr. Wetzel --
18 WITNESS WALZEL: Walzel.
19 Q -- Walzel. I'm sorry. I'm sorry,
20 sir.
21 Or, Mr. Kopecky, just to clarify, I
22 think you mentioned you had to pump on it to
23 kill it?
24 WITNESS WALZEL: A Right.
25 Q What are you trying to achieve
26 there? You are pumping some medium down?
27 A Yeah.
28 Q Can you kind of describe that

1 process. Like, what are you trying to...
2 A Well, yeah, to, you know, to kill a
3 well you need to have hydrostatic equal to or
4 higher than the reservoir pressure. So from
5 that, you can come up with how many
6 pounds-per-gallon fluid you need, and then,
7 you know, on a well that's flowing, you know,
8 you kill it with mud weight and pump rate.
9 So, you know, part of the initial
10 pump was, you know, if it works, it works.
11 If it doesn't, it might give us some
12 information to, you know, use in the future
13 attempts.
14 Q You mentioned reservoir pressure.
15 Is that a number that you guys calculate or
16 is that a number that was given to you by
17 SoCalGas?
18 A It was a number given to us.
19 Q So is that an important input for
20 the first well-kill attempt?
21 I mean, did you -- I'm
22 understanding it to be almost like, you know,
23 do your best to design it, to overcome it. I
24 don't want to put words in your mouth --
25 WITNESS WALZEL: A Right.
26 Q And then see what happens?
27 WITNESS WALZEL: A Well, not "to see
28 what happens," but, you know, we know our --

1 you know, come up with our kill weight. You
2 know, we didn't know -- or you know, the
3 variables would be if, you know, we could
4 pump and overcome -- you know, get enough
5 hydrostatic in the well bore to maintain the
6 reservoir pressure.
7 Q And when that number was given to
8 you, was it verbal or was it written or a
9 record?
10 WITNESS WALZEL: A Well, I know it was
11 verbal and there might -- some record, you
12 know, written down somewhere.
13 Q Just based on your experience, is
14 that reservoir pressure reasonable? I mean,
15 did it sound reasonable?
16 A I mean, you know, as far as
17 reasonable, I mean, it's -- I don't remember
18 what --
19 WITNESS KOPECKY: A I don't recall
20 what it was.
21 WITNESS WALZEL: A I don't remember
22 what the equivalent mud weight was, but it
23 wasn't abnormally high.
24 Q So if I understand you correctly,
25 whatever the reservoir pressure was, you then
26 designed the mud weight --
27 WITNESS WALZEL: A Right.
28 Q And that mud weight didn't stand

1 out as abnormal?
2 WITNESS WALZEL: A No.
3 Q It was kind of in the ballpark, if
4 you will?
5 WITNESS WALZEL: A Yeah, we worked on
6 mud weights up to -- a lot higher, you know,
7 and normal mud weight.
8 MR. BRUNO: Okay. I do have one more
9 question. I apologize for jumping in,
10 Darryl.
11 MR. GRUEN: That's okay.
12 MR. BRUNO: Q The first meeting, you
13 know, the check-in with the incident
14 commander, prior to the first well-kill
15 attempt, was there any sort of feeling this
16 was going to be a standard well-kill attempt
17 or this one's different or this is going to
18 be a several month...
19 WITNESS WALZEL: A We didn't have any
20 expectations.
21 Q Yes, sir.
22 Is it always like that, there are
23 just no real expectations, it just kind of
24 depends?
25 A I mean, we don't -- yes. I mean,
26 we don't show up, Oh, this is going to be a
27 two-day job or a three-day job or two-month
28 job.

1 WITNESS KOPECKY: A And when we
2 attempted to first kill, you're always in
3 hopes that it's going to kill, that you're
4 going to be successful in killing the well.
5 WITNESS WALZEL: A Yes.]
6 EXAMINATION (resumed)
7 BY MR. GRUEN:
8 Q Just a couple of follow-ups on the
9 reservoir pressure and how that input got to
10 you. Did they -- so SoCalGas gave you the
11 reservoir pressure as an input for you to
12 calculate your mud weight?
13 WITNESS WALZEL: A Yes.
14 Q Did I follow that right? Okay.
15 Did they explain to you how they came up with
16 the reservoir pressure?
17 A They had pressure gauges.
18 Q What -- in giving you a number --
19 what was their basis for giving you the
20 number?
21 A To figure out the -- know what your
22 equivalent mud weight is.
23 Q Sure. I'm asking the question the
24 wrong way.
25 What were they -- did they do
26 anything to show you how they came up with
27 the number?
28 A I mean, what do you mean by "how

1 they came up with the number"?
2 Q You talked about logs?
3 A Right.
4 Q Did they show you the logs?
5 A I mean, it wouldn't be -- it
6 wouldn't be -- I mean, when I talk about
7 logs, I'm talking about noise temperature
8 levels. I mean, they have pressure gauges,
9 and they are maintained -- it's their gas
10 storage, so they know what the pressure is.
11 You know?
12 Q Okay. So I think I'm hearing --
13 and check me on this -- that typically
14 someone would come up with a reservoir
15 pressure based on things like noise
16 temperature logs?
17 A No.
18 Q Okay.
19 A Yeah. When I talk about logs --
20 no, I mean, it's -- they are gas-filled.
21 They are putting gas in it, taking gas out.
22 They have censors or, you know, pressure
23 gauges.
24 Q So they would -- they -- did they
25 show you that information -- any of that
26 information? I think we're going around the
27 same thing, but I'm just trying to understand
28 your answer, if they actually showed you the

1 results from the noise temp logs?
2 A It wouldn't have been -- noise temp
3 wouldn't have showed us the pressure. I
4 mean, there's a pressure gauge and a number
5 on it and --
6 Q Okay. Okay. So -- yeah, I think
7 we'll get back to it.
8 MR. SHER: Darryl, may I?
9 MR. GRUEN: Yeah.
10 MR. SHER: Q Just with regards to
11 pressure gauges, do you know -- are those
12 pressure gauges in the well itself, or are
13 those pressure gauges throughout the fields?
14 A I don't know where their gauges
15 were set up.
16 MR. GRUEN: Okay. Okay.
17 EXAMINATION
18 BY MR. BRUNO:
19 Q And Mr. Walzel or Kopecky --
20 Mr. Kopecky, you guys didn't see the gauge,
21 but there was a gauge that registered the
22 reservoir pressure; is that what you're
23 saying?
24 WITNESS WALZEL: A I mean, we saw
25 gauges on wells, and -- you know, I don't
26 recall what that number was right now or --
27 but anyways.
28 Q Right.

1 A So we -- you know, there was gauges
2 on wells out there.
3 Q But it's a direct measurement.
4 It's not a calculated -- in other words, when
5 we talk about reservoir pressure, you're
6 saying that that can be read on a gauge?
7 A Right.
8 Q Okay. Is that --
9 WITNESS KOPECKY: A In pound per
10 square inch. That's what we're referring to.
11 Q And it's atmosphere -- it's at
12 surface?
13 A Correct.
14 WITNESS WALZEL: A Right.
15 Q Does that measure the full pressure
16 of the reservoir all the way down to the
17 bottom hole?
18 A Well, you would have to account for
19 hydrostatic -- or the gas gradient from
20 surface to the reservoir, but yes, I mean,
21 calculate it -- you can calculate it.
22 Q When you're designing your mud or
23 your kill fluid, if you will --
24 A Right.
25 Q -- is it that reservoir pressure or
26 is it also a calculation? Could you maybe
27 talk about that a little bit, like how it --
28 you mentioned gradient. I'm not an expert,

1 sir, so --
2 A Right. So your reservoir has a
3 pressure. Then there's a -- in this
4 instance, it was a gas column, and then
5 there's a pressure gauge at the surface. So
6 you would -- you know, you read your --
7 WITNESS KOPECKY: A Pressure.
8 WITNESS WALZEL: A -- pressure on the
9 gauge and then add the hydro -- the gas
10 gradient column and then add those two
11 together, and it would give you your
12 reservoir pressure.
13 Q And it's that reservoir pressure,
14 when you add them together, that you are
15 designing your mud to?
16 A Well, yes, I mean, you get -- if
17 your reservoir's a thousand PSI and then --
18 there's a formula: .052 times the mud weight
19 times the depth gives you a pressure. So you
20 can calculate what that mud weight would need
21 to be.
22 Q And that calculation of adding the
23 column pressure to the gauge pressure, if you
24 will, was that done by Boots & Coots, or that
25 was done by SoCalGas?
26 A I'm sure. Yeah, I mean, we would
27 have -- I mean, we would have calculated it,
28 you know, ourselves to come up with --

1 WITNESS KOPECKY: A There would have
2 been more than one person running the
3 calculation.
4 Q It's an important number. So a lot
5 of checks?
6 A And it's a pretty simple
7 calculation.
8 Q Does that formula have a name that
9 you described?
10 WITNESS WALZEL: A Gas gradient.
11 Q Gas gradient?
12 A What I would call it.
13 Q Is that synonymous with flow rate?
14 A No. I mean, pressure and flow rate
15 are -- you can have high pressure, low flow
16 rate, low pressure, high flow rate. I mean,
17 I don't know what you mean by "synonymous."
18 Q Does the flow rate factor into the
19 equation for determination of mud weight?
20 A On a dynamic kill, yes, it would.
21 Q The design for the first well-kill
22 attempt, was that a dynamic kill?
23 A It would have -- we were pumping on
24 a well that was flowing, so it would have
25 been -- there was unknowns of flow paths, how
26 much it was flowing, reservoir, you know --
27 there was some unknowns. So you design it
28 for the max we could pump, and that's the max

1 you could pump.
2 MR. SHER: Q Just for clarification,
3 you said the first well-kill attempt. Is it
4 true that SoCalGas tried to do a well-kill
5 attempt prior to Boots & Coots' first
6 attempt.
7 A I mean, I wasn't there, so I don't
8 know.
9 Q Did they provide you any
10 information as to whether or not they
11 attempted an attempt to kill the well prior
12 to Boots & Coots doing so?
13 WITNESS KOPECKY: A I didn't see any
14 documentation.
15 MR. GRUEN: Q What other things
16 factored into the calcs for Boots & Coots'
17 first well-kill attempt? So you talked about
18 flow rate.
19 A Right.
20 Q You talked about the other factors
21 that you used to make your calculation.
22 A Like I said, there was unknowns of
23 where flow path might be, how -- the rate of
24 flow. You know, if it's a small hole, it
25 might be flowing really fast. There's
26 several unknowns. All we knew was, hey, our
27 wellhead equipment is only good for this. So
28 that's our limiting factor.

1 WITNESS KOPECKY: A Limiting factor.
2 WITNESS WALZEL: A So we pumped as
3 fast as we could, and that -- you know, the
4 wellhead -- you don't want to exceed your
5 wellhead equipment.
6 Q Got you. Can you describe what the
7 different unknowns were that you just talked
8 about?
9 A Yeah. Initially, you know, any
10 possible flow paths, conditions of the two
11 being -- conditions around -- you know,
12 around the well -- you know, the formation
13 around the well. But, you know, the flow
14 rate and flow paths were, you know, probably
15 the two biggest.
16 Q Okay.
17 EXAMINATION
18 BY MS. ROSE:
19 Q Two biggest unknowns?
20 A Right.
21 Q Okay. In your experience, is it
22 possible to get that -- have you in past
23 well-kill attempts been able to get flow
24 paths and flow rates to get perfect
25 information for those things?
26 A Well, from -- you know, from
27 running, say, a noise temp log, you can get a
28 picture of where the flow might be entering

1 and exiting a wellbore. Spinner survey is
2 nothing more than a little spinner on a tool,
3 and if it's not spinning, it's not flowing.
4 If it's spinning somewhere, you can kind of
5 pinpoint holes. There's USIT logs and
6 different logs to run to get a picture of the
7 flow paths.
8 And then you can -- if the well is
9 being diverted, you can set up pressure
10 gauges and get an estimate of gas flow. Or,
11 you know, if it's several -- if it's oil,
12 water, gas, you know, makes it a little more
13 complicated to get an exact. But, you know,
14 typically, you know, you design it, and then
15 you can put in a -- you know, you'd have
16 extra hydraulic horsepower and stuff to -- if
17 you need to pump more. But in this case, the
18 5,000 PSI was kind of limited on how fast you
19 could actually pump on the well.
20 Q So with regards to the noise temp
21 logs and the spinner surveys and those
22 things, were any of those used here in order
23 to get access, get a better understanding of
24 the flow paths and the flow rates?
25 A Yes.
26 Q Can you talk about that more?
27 A Yes. I don't recall if we did it
28 after the first attempt or second attempt,

1 but we ran noise temperature. And from what
2 I recall, there was a severe cooling at -- it
3 was -- it was over a range, but it was cold
4 enough that the tools weren't communicating
5 with the logging truck. That was the first
6 I've ever seen.
7 EXAMINATION
8 BY MR. SHER:
9 Q What does that mean if it's cold?
10 A I guess the tools have -- oh. If
11 it's cold, that means the gas is expanding in
12 the cooling. And I guess the tools -- I
13 don't know if it was how the temperature
14 rate -- I never seen it before, but over that
15 range, it was -- or those depths, it was
16 cold. So the tool was not communicating with
17 the logging truck. So we ran it, and it was
18 cold over -- I don't remember the depth,
19 but -- exactly, but you know, maybe, say, 800
20 to 1,000 foot there was a cooling. So we ran
21 the spinner survey, and it didn't show
22 anything until, I remember, right at the
23 bottom it was spinning.
24 So, you know, at the time it
25 appeared that the gas was exiting the tubing
26 fairly deep. Then we also -- yes. So we ran
27 those two.
28 Q Sorry. By "fairly deep," in your

1 experience, is that 1,000 feet or 8,000 feet?
2 A Yeah. I'm sorry. When I say
3 "fairly deep," it was just -- well, it was
4 as -- I don't remember the number, but the
5 spinner looked normal until it got as deep as
6 we ran it in the well. When I say "fairly
7 deep," it was towards the bottom of the well.
8 So that's why I said "fairly."
9 Q So that gives you an idea that the
10 gas is escaping the tubing or the casing at
11 some point deeper than 1,000 feet in the
12 well?
13 A No. Well, it gave a range. It was
14 kind of a -- it was cold over -- you know, it
15 was cold over certain -- again, the
16 information wasn't being sent to the logging
17 truck very good -- very well. So it was just
18 a range of depth where it was cold. So there
19 wasn't -- you couldn't say, Oh, it's right --
20 there's a hole right here. It was just
21 somewhere over -- there's likely a hole.
22 Q Okay.
23 MR. SHER: Q Sorry. On that point --
24 so when you have gas expanding and creating
25 cooling, it means that gas is going from a
26 smaller, maybe, aperture to a larger -- is
27 that --
28 A Are you talking about hole size?

1 Q Yes.
2 A I mean, it means it's going through
3 a hole and expanding.
4 MS. ROSE: Q So the volume of the gas
5 would be increasing?
6 A Yeah. I mean, it's expanding.
7 MS. ROSE: Yeah.
8 EXAMINATION (resumed)
9 BY MR. GRUEN:
10 Q So just regarding the flow paths
11 and flow rates -- so the noise temp logs, you
12 ran it. You ran a spinner survey, right?
13 A Mm-hmm.
14 Q You did your own noise temp log?
15 You created your own?
16 A What do you mean by I created it?
17 Q I'm wondering if you used
18 SoCalGas's -- if they provided you a noise
19 temp log or --
20 A No. There was one run while we
21 were out there.
22 Q And you used the information that
23 you had from both the noise temp log and the
24 spinner survey while you were out there?
25 A Right.
26 Q Did you get any information from
27 SoCalGas about the condition of the well
28 before you got out there?

A No.

Q No. Okay.

WITNESS KOPECKY: A No.

MR. GRUEN: Okay.

MR. SHER: Darryl -- sorry -- I just want to note it's 11:15. Does anyone need a break for the bathroom?

WITNESS KOPECKY: A Sure.

MR. GRUEN: Let's go off the record.

(Off the record.)

MR. GRUEN: Back on the record.

Q If we can just -- if we could keep moving forward. I'm trying to get a time line as best we can.

WITNESS WALZEL: A Mm-hmm.

Q So when you first came out -- and we were talking a little bit about a well-kill attempt that you did -- how soon after you came out approximately do you remember that you started the first well kill?

A Oh. I don't recall how many days that was.

Q Okay.

WITNESS KOPECKY: A I do not either.

Q Do you recall approximately how many well-kill attempts you did?

A I recall approximately three to

1 possibly five.
2 Q Over how long a period
3 approximately?
4 A Approximately 28 days.
5 WITNESS WALZEL: A Right.
6 Q Okay. And again, approximately how
7 often did you do each well-kill attempt?
8 WITNESS KOPECKY: A I don't recall.
9 WITNESS WALZEL: A I don't recall how
10 many days were in between because between
11 some of them we were doing -- we had -- we
12 had to do other things.
13 Q Okay. Okay. So three to five
14 well-kill attempts over about 28 days. Do
15 you recall how -- so I think you described
16 the weight of the mud and the pressure that
17 you used on the first attempt that you tried?
18 A Right.
19 Q How did those factors change, if at
20 all, from the first attempt to the second?
21 A I mean, the reservoir pressure was
22 decreasing. You know, that's -- that would
23 be the reservoir pressure, and maybe the flow
24 coming from the well might have decreased.
25 But again, that was over time. The pressure
26 was the only thing that I recall recorded
27 that could be verified had changed.
28 Q Decreasing?

1 A Decreasing.
2 Q Okay. Okay. Anything to add, Mr.
3 Kopecky?
4 WITNESS KOPECKY: A No. Just as Danny
5 says, the pressure was decreasing, and going
6 by memory, to my knowledge, SoCal was
7 reducing that pressure by moving from that
8 reservoir -- moving the gas.
9 Q As the pressure decreased, how
10 would you adjust the weight of the mud?
11 WITNESS WALZEL: A Well, I mean, I
12 don't recall how -- if the mud weight was
13 changed or if we changed the mud weight while
14 we did it.
15 Q Okay.
16 WITNESS KOPECKY: A And just for
17 clarification -- and we typically use the
18 term "mud weight," but I don't recall -- I
19 don't recall if it was actually mud or if it
20 was a clear brine.
21 Q So there was a substance, and you
22 were figuring out what weight to use?
23 WITNESS KOPECKY: A Right.
24 WITNESS WALZEL: A Right.
25 Q Did you consider other options? I
26 assume this -- maybe I should clarify this.
27 These were all top well attempts, right?
28 A Mm-hmm.

1 Q Were there -- I don't have the
2 knowledge that you both have. Were there
3 other options that you considered other than
4 the top well-kill attempts in order to kill
5 the SS-25?
6 A We discussed a relief well.
7 WITNESS KOPECKY: A And I was aware
8 that they were -- SoCal was making the
9 preparations and physically saw them. I
10 don't remember on what day I physically saw
11 preparations being made in constructing pads,
12 and things of that nature -- two pads, as a
13 matter of fact, but they were making
14 preparations to drill the relief well
15 simultaneously. Of course, it takes time to
16 get everything together -- a rig. So it
17 really wouldn't be same options, but they
18 were proceeding with that -- that
19 contingency.
20 Q Did you have any recommendations --
21 did you talk with them about the relief well?
22 A I didn't personally, but I know
23 that Boots & Coots did.
24 WITNESS WALZEL: A Right.
25 Q Who at Boots & Coots talked to
26 SoCalGas about the relief well?
27 A Well, the conversation I recall
28 early -- and I don't remember if it was after

1 the first or the second, but early on in the
2 thing, you know -- hey, we always want to be
3 planning a relief well in case surface
4 intervention doesn't work or isn't possible.
5 And they were -- I was told our engineers are
6 gathering data and coming up with a plan.
7 Then our -- we have -- a relief
8 well group started working with them and
9 planning relief well directories, you know,
10 the kill from the relief well to the blowout
11 well, but I wasn't involved with the relief
12 well planning. But early on in the planning
13 it was already -- the wheels were -- the
14 process was in motion.
15 Q Okay. Just in terms -- let me go
16 back to the three to five well-kill attempts
17 that you made. I get it. This is a rough
18 estimate. Again, we're talking about
19 something about three years ago. So just in
20 your experience, how often have you been
21 successful on your first well-kill attempt
22 approximately?
23 A Oh, I wouldn't have a number
24 percentage-wise.
25 Q Can you give a rough estimate?
26 A I mean, I could say they are not
27 always killed on the first time.
28 Q So maybe between 80 and 90 percent

are killed on the first time or 50 and 60 percent are killed the first time?

A I mean, I wouldn't have -- I wouldn't know a percentage.

Q I guess I'm wondering just based on your experience how often -- how often -- I get that they are not all killed the first time, but they are -- some of them are killed the first time, I would imagine, right?

A Yeah. Some are.

Q So are we closer to almost all of them being killed the first time, or is it closer to almost none of them being killed the first time?

A I mean, I don't have a percentage. Somewhere in between.

Q Okay. How about you?

WITNESS KOPECKY: A No, I'm thinking -- trying to, but I can't come up with any kind of percentage either.

Q Was Columbia killed the first time?

WITNESS WALZEL: A If I remember, it bridged on its own.

Q So that means -- by "bridging," it actually stopped the gas from leaking? In the case of Columbia, it stopped the incident naturally?

A Yeah.

1 Q Did you try to kill?
2 A It bridged. If I remember, it
3 bridged as we were getting -- we were -- the
4 snubbing unit rigged up.
5 Q Oh, I see. What about some of the
6 other wells that you talked about in the past
7 year, did those -- that you mentioned to Ms.
8 Rose -- were those successful -- other than
9 Columbia, were those successful kills in the
10 first attempt?
11 WITNESS KOPECKY: A Honestly, I think
12 those -- any other wells that we mentioned
13 are somewhat -- other than the one similarity
14 that we brought up about Columbia, I think
15 other well attempts would be somewhat
16 irrelevant. That is, as we had stated
17 earlier, every situation is different. I
18 mean, it may appear similar, but there's
19 different information that goes into the
20 strategy.
21 Q Right. So I hear what you're
22 saying, and I -- I think I just like to get
23 the facts out and understand. And I get that
24 you haven't given me a specific answer to
25 this also, and I'm asking you guys both
26 directly. Okay? So let's just get this down
27 and be sure. It could be because I may have
28 some follow-ups. Okay. So just with those

1 well-kill attempts, even noting your point
2 about it not being relevant, I'd still like
3 you to answer the question. Okay?
4 So in terms of -- all right. So
5 Columbia bridged on its own. I'm just
6 looking for the other leaks. I think Mr.
7 Kopecky, you had identified a couple of them.
8 There was Columbia, Trinidad-Tobago -- did
9 that one -- was that one killed on the first
10 attempt successfully?
11 A Yes, it was.
12 Q South Texas, was that one killed on
13 the first attempt successfully?
14 A No.
15 Q When was that one killed?
16 A Maybe on the third circulation.
17 What I mean -- for clarification,
18 we're talking apples and oranges. That was a
19 drilling well. It wasn't a production well
20 or a storage well. That well was being
21 drilled. There was totally different
22 circumstances on the well in Trinidad-Tobago.
23 It took 7 barrels of fluid to kill the well.
24 Q I appreciate the clarification.
25 That's helpful. I think I'm understanding
26 why you're saying it's not relevant.
27 A Yes, sir.
28 Q So that's helpful in context.

1 Okay. Let me just ask -- I think you had
2 talked a little bit about some kind of
3 information -- some kinds of records that you
4 need or that you typically use, and I think
5 one of the things that you mentioned was
6 drilling -- drilling records and well
7 history. So could you talk about, in the
8 case of SS-25, what information you asked for
9 from Southern California Gas Company in order
10 to do your work?
11 A Yes, they provided drilling records
12 when the well was drilled. There was a --
13 some old logs, and I believe it was -- you
14 know, I can't recall what logs, but anyway,
15 you know, just your basic, you know -- what
16 the, you know, the drilling records were from
17 the company that drilled the well case and
18 sizes. There might have been some
19 resistivity log in there. I don't recall
20 exactly what it was. But you know, it would
21 have been something just to determine fluids
22 in the formation when they drilled the well
23 years ago.
24 Q Anything else?
25 A Not that I can recall right now.
26 Q Anything?
27 WITNESS KOPECKY: A No, sir.
28 Q That's helpful. So in terms of the

1 drilling records, what do you typically
2 expect to see in a drilling record given your
3 experience?
4 A Well, the normal drilling record
5 today would be we drill from this depth to
6 this depth, mud weight of this -- basically
7 just a diary of what happened at the well
8 that day.
9 Q Okay. So on a historic basis,
10 day-to-day, dating back to the beginning of
11 the well?
12 A No. This would have been during
13 the drilling process of the well.
14 Q Okay. When the well was initially
15 drilled?
16 A Correct.
17 Q Got you. Okay. And what did you
18 see in the drilling records in the case of
19 SS-25? What did you see in those drilling
20 records?
21 A Today we drilled this depth to this
22 depth, ran this casing, submitted this
23 casing, your normal drilling activity.
24 Q Did you say -- was there any
25 information regarding the drilling activity
26 that you just described that was missing?
27 A No.
28 Q How about -- what would you see on

1 the logs and the other records that you
2 talked about? What would you expect to see
3 in those cases?]
4 A From what I recall, the log, it
5 would have been a resistivity, which it was,
6 you know, a typical log that after a well
7 drill, it would have said, okay, this zone is
8 water-bearing or oil-bearing or, you know,
9 just a normal logs run after a well is
10 drilled.
11 Q Okay. So when you say
12 water-bearing, can you just clarify what that
13 means.
14 A Well, I mean it would tell you. It
15 would give you an idea if a certain zone has
16 water in it or oil in it or, you know,
17 resistivity of the fluids in the well.
18 Q Okay. And why is that? Why do you
19 need that information?
20 A Well, the whole idea for drilling
21 the oil well was to find oil so, you know, a
22 company would run them to say, hey, this
23 might be oil right here.
24 WITNESS KOPECKY: A It would give you
25 an indication of where you set your pipe.
26 Q Gotcha. So the higher the
27 resistivity, the more likely that you might
28 find oil?

1 A Right.
2 Q Okay, I follow. So what other
3 things within the well history, what other
4 records would you -- in order to do your work
5 in the course of your work -- would you ask
6 to see in order to kill a well?
7 A First of all, just for
8 clarification again, I didn't examine any of
9 the drilling records. I think I did -- the
10 only records I saw on the well were of a
11 wellhead schematic.
12 Q Okay. And what was the purpose in
13 seeing -- in asking for and seeing the
14 wellhead schematic?
15 A Well, typically when we do that, it
16 kind of helps you determine for a fact
17 tubular size by your nomenclature of your
18 wellhead equipment. If you've got a 2 7/8,
19 3 1/2, whatever, 2 3/8 tubing, typically you
20 can't see in the well, of course. And if
21 someone says, hey, we got 2 7/8 tubing and
22 typically the well will have 2 9/16 tree on
23 it, so it's just different factors that you
24 put together to draw you to a conclusion.
25 Q Okay.
26 WITNESS WALZEL: A And that
27 information is needed, you know. If we're
28 going to rig up a wireline unit or whatever,

1 you need to know flange sizes so if you need
2 to order out a valve, you know what size
3 valve to order out to, you know, to put on
4 the tree or whatever.
5 WITNESS KOPECKY: A Basically so you
6 know what you're working with.
7 Q Okay. And so what equipment, if
8 any, did the wellhead schematic -- did you
9 make any decisions about what equipment to
10 use based on the wellhead schematic?
11 WITNESS WALZEL: A I mean it would
12 have been additional valve, you know, size of
13 the valve. But if we needed to rig up a
14 wireline, we need to go from this size flange
15 or, you know, basically that would have been
16 it. That wouldn't have determined what
17 equipment we need to order, just what do we
18 need to order to rig up the equipment.
19 WITNESS KOPECKY: A We did add -- we
20 did an additional swab valve or crown valve,
21 if you will, just as an additional barrier.
22 Q What is a swab valve or a crown
23 valve?
24 A It's located at the uppermost of
25 the tree, just below your tree cap or your
26 bottom hole test adapter.
27 Q Okay.
28 A It would be your top component on

1 the tree itself.
2 Q Thank you. Were any of the flanges
3 or the valves, was there any that didn't fit
4 properly or that weren't used, that you
5 couldn't use effectively when you used the
6 equipment to hook up?
7 WITNESS WALZEL: A No.
8 WITNESS KOPECKY: A No, not to my
9 knowledge.
10 WITNESS WALZEL: A Because we rigged
11 up a, you know, ran pipe, plumbed everything
12 up from the wellhead up and tied in, you
13 know. As I recall, the valves were working.
14 WITNESS KOPECKY: A Yes.
15 Q Okay. Thank you.
16 A The equipment, service equipment,
17 was in relatively good condition.
18 Q Okay. And based on the wellhead
19 schematic, all the equipment that you had
20 hooked up properly, the wellhead schematic --
21 A It was accurate.
22 Q -- information was accurate?
23 WITNESS WALZEL: A Yeah.
24 WITNESS KOPECKY: A And then we
25 confirmed it visually.
26 Q All right. What other information
27 did you ask for regarding the history of the
28 well, if any?

1 WITNESS WALZEL: A I mean that would
2 have been -- I believe that covered all the
3 information.
4 Q Okay.
5 MR. BRUNO: Yeah, if I may.
6 MR. GRUEN: Yes.
7 EXAMINATION
8 BY MR. BRUNO:
9 Q Mr. Walzel or Mr. Kopecky, just on
10 the wellhead itself, I think we're talking
11 about the schematic so I do have a question.
12 Going back earlier we talked about you don't
13 want to exceed your wellhead equipment when
14 we're designing the, you know, the --
15 WITNESS WALZEL: A Correct.
16 Q -- to overcome. Was the wellhead
17 sufficient to overcome the --
18 A Yes.
19 Q -- the reservoir pressure?
20 A Yes.
21 Q So it wasn't limited by the
22 wellhead equipment?
23 A No. Limited to how fast we could
24 pump on it.
25 Q So it was limited by how fast you
26 can pump but not the weight?
27 A Right, yeah. Well, it has a
28 pressure rating. Every wellhead has a

1 pressure rating, 3,000, 5,000, 10,000 PSI,
2 whatever it is. And, you know, you don't
3 want to apply pressure that's more than what
4 it's rated for.
5 Q Right. You don't want to yield
6 a --
7 A Right.
8 Q -- piece of steel?
9 A Correct.
10 Q If you had a more robust wellhead
11 on 25, would you have pumped at a higher
12 rate?
13 A You would have to -- you'd have to
14 look at the tubulars and all that but, you
15 know, the wellhead was a design. It was fit
16 for purpose in our opinion.
17 WITNESS KOPECKY: A My recollection,
18 and I don't recall the number of the
19 reservoir pressure, but I think my best
20 recollection is the wellhead working pressure
21 of 5,000 pounds pretty far exceeded that
22 reservoir pressure.
23 Q Okay, so based on the reservoir
24 pressure, the ensuing calculations, and the
25 design, you weren't limited by the wellhead?
26 You were able to design a good plan to go in
27 with the first well built in?
28 WITNESS WALZEL: A Yes. I mean we

1 designed it to not exceed the pressure rating
2 of the wellhead equipment.
3 EXAMINATION
4 BY MS. ROSE:
5 Q Would you have pumped at a higher
6 pressure if the wellhead had been rated for a
7 higher pressure?
8 WITNESS WALZEL: A If it was rated for
9 it --
10 Q Yes, if it --
11 A -- and the tubulars were rated for.
12 Q Is it always better to pump at a
13 higher pressure?
14 A Not always but, you know, if you
15 pump at a faster rate, then you'll have a
16 higher pressure --
17 Q Yeah, and that's --
18 A So, but --
19 Q -- desirable?
20 WITNESS KOPECKY: A Well, just to
21 clarify again, the wellhead was normal. You
22 wouldn't find a higher rated -- on this type
23 of well, you would not find a higher rate
24 working pressure assembly anywhere.
25 Is that accurate?
26 WITNESS WALZEL: A Yeah.
27
28

1 EXAMINATION (resumed)
2 BY MR. GRUEN:
3 Q So this was -- what that means is
4 this is the highest pressure which you could
5 pump on this particular well?
6 WITNESS WALZEL: A Correct.
7 Q Why is that the case, that this is
8 the highest rated I guess, the highest
9 pressure at which you could pump based on
10 this wellhead for this kind of well?
11 WITNESS KOPECKY: A Your wellhead
12 design is based from when the well is drilled
13 taking in consideration your formation
14 pressure.
15 Q Okay. And so this --
16 A Whereas, your formation will not
17 exceed the rated working pressure of your
18 surface equipment.
19 Q So if you pumped at a higher
20 pressure than what this wellhead was designed
21 to handle, what would have happened?
22 WITNESS WALZEL: A Well, if you
23 exceed -- I mean there's a possibility of
24 your wellhead equipment failing if you exceed
25 the rating of it.
26 WITNESS KOPECKY: A Correct.
27 Q All right, okay. In terms of -- I
28 want to just go back to the timeline for a

1 second. You talked about being there for
2 about 28 days, and I think you were talking
3 about three to five well kill attempts. In
4 terms of that, how quickly did you get the
5 drilling records when you asked for them?
6 When did they provide -- when did SoCalGas
7 provide those to you?
8 A I don't know that. Danny may.
9 WITNESS WALZEL: A As I recall, they
10 had them with them already.
11 Q And same then for the resistivity
12 logs?
13 A Yes. It was a folder and all the
14 documents were in it.
15 Q Okay. All the documents you needed
16 to do your work?
17 A Yeah.
18 Q Okay, I follow.
19 WITNESS KOPECKY: A And just, if I can
20 interject, when I stated 28 days, that's
21 because I spent approximately 28 days which I
22 think everyone is aware, I think the event
23 was a little longer than that. I had rotated
24 out.
25 Q Gotcha. Thank you. I appreciate
26 that and thanks for the reminder on that.
27 Were you there longer, Mr. Walzel?
28 WITNESS WALZEL: A I was. And I

1 either got home on December 4th or
2 December 14th. I think it might have been
3 the 14th.
4 Q Let's see if I'm doing my math
5 right here. So you would have come out --
6 WITNESS KOPECKY: A I took the call
7 late October, I think, very end, 28, 27
8 October. I returned to Texas, to Houston,
9 late November so that's the best I can --
10 Q Right around Thanksgiving it sounds
11 like, give or take?
12 A Right, right -- no, I think I
13 missed that. I did.
14 Q Oh, is that right? Okay. You had
15 Thanksgiving at Aliso Canyon?
16 A Right.
17 WITNESS WALZEL: A Yes, we did.
18 MR. SHER: Probably wasn't a laughing
19 matter.
20 MR. GRUEN: Q I laugh now, but I
21 wouldn't have been laughing then either. Do
22 you recall how long after Thanksgiving you
23 had to stay?
24 WITNESS KOPECKY: A I don't. I know I
25 was there approximately 28 to 30 days.
26 Q Okay, that's helpful. And you were
27 there. So, Mr. Walzel, you were there
28 another week to two and a half weeks

1 yourself?
2 WITNESS WALZEL: A Correct.
3 Q The extra time that you were there,
4 were there any additional well kill attempts
5 that you recall?
6 WITNESS WALZEL: A I don't -- I know
7 by when I had left, there had been no more
8 attempts. And I don't know when -- I don't
9 remember what day the last one was, but
10 towards the end of my time there, it was
11 already had turned into, you know, relief
12 well.
13 And the last week or two is I would
14 say we were just there to, you know, monitor
15 the 25 site and keep it secure, monitor it
16 while they -- while they got ready for the
17 relief well. And then I made a few trips
18 down there to the rig while they were rigging
19 up.
20 Q Yeah.
21 A But they didn't -- they hadn't
22 started drilling by the time I got out of
23 there. They were still in the rigging up
24 process.
25 Q Okay. And after you both left,
26 especially after you left since you left
27 later, Mr. Walzel, did Boots & Coots
28 recommend any additional well kill attempts?

1 A No.
2 WITNESS KOPECKY: A I have no
3 knowledge either of that.
4 Q Do you know if SoCalGas tried any
5 additional well kill attempts after you both
6 left?
7 WITNESS WALZEL: A No. As I recall,
8 there was no more. I mean after the last one
9 we did, the decision was made to go in the,
10 you know, relief well.
11 Q Thank you.
12 MR. SHER: Can we go off the record?
13 (Off the record.)
14 (Whereupon, at the hour of 12:00
15 p.m., a recess was taken until 1:00 p.m.)]
16 * * * * *
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1 AFTERNOON SESSION - 1:10 P.M.
2 * * * * *
3 EXAMINATION (resumed)
4 BY MR. GRUEN:
5 Q So a couple points of
6 clarification, I think before, during this
7 morning, you'd mentioned that Danny Clayton
8 was the team lead?
9 WITNESS WALZEL: A Uh-huh.
10 Q What does that mean being the team
11 lead? What did he do in his role?
12 WITNESS KOPECKY: A He communicates
13 with the client directly, and coordinates a
14 plan with the client, and then we would
15 execute the plan.
16 Is that fair, Dan?
17 WITNESS WALZEL: A Yes.
18 Q Thank you.
19 Did Danny, on the Boots & Coots'
20 side, also talk to anyone else in order to
21 execute the plan?
22 MR. SHER: For clarification,
23 "Mr. Clayton"?
24 MR. GRUEN: Thank you, Danny Clayton.
25 Q Did you understand I meant Danny
26 Clayton?
27 WITNESS KOPECKY: A Yes.
28 Q So when you were doing your work,

1 you would report directly to Danny Clayton?
2 WITNESS WALZEL: A Correct.
3 Q And as far as you know, Danny
4 was -- basically, Danny was making the
5 decision on the Boots & Coots' side about how
6 to move forward; is that fair?
7 WITNESS WALZEL: A Yes.
8 WITNESS KOPECKY: A Yes.
9 MR. SHER: Clarify, with input from the
10 rest of the team?
11 WITNESS KOPECKY: A Correct.
12 WITNESS WALZEL: A Yes.
13 MR. GRUEN: Okay. That's helpful.
14 Q Given the time you were out there
15 and what your experience was on the well-kill
16 attempts on SS-25, do you think that Southern
17 California Gas Company could have seen the
18 incident coming beforehand?
19 WITNESS WALZEL: A I don't believe so.
20 WITNESS KOPECKY: A I don't believe
21 there was any way to see that.
22 Q Okay. And that's true even if you
23 had been in their shoes, given all the
24 experience that you have, would you have been
25 able to see it coming beforehand?
26 WITNESS KOPECKY: A No.
27 Q Do you agree?
28 WITNESS WALZEL: A No.

1 Q That makes sense. I just want to
2 ask you a little bit about what you think
3 caused the incident there to best of your
4 knowledge. So given your experience and
5 background, not only with wells in general,
6 but with what happened on SS-25, to the best
7 of your knowledge, what do you think caused
8 the incident?
9 WITNESS WALZEL: A I can't comment on
10 what caused it. When we got through, there
11 was a hole in the tubulars somewhere, but as
12 far as what caused it, we weren't -- that
13 wasn't -- we didn't look into what caused it.
14 Q Okay. That's fair.
15 Anything to add?
16 WITNESS KOPECKY: A No. I agree.
17 Q Have you seen any pictures of Well
18 SS-25 since the incident?
19 WITNESS WALZEL: A No.
20 WITNESS KOPECKY: A No, I have not.
21 Q Okay. And that includes any
22 pictures of any of the tubing or the casing
23 that's been removed from the well, you
24 haven't seen anything?
25 WITNESS KOPECKY: A No, sir. I have
26 not.
27 WITNESS WALZEL: A No.
28 Q Thank you. This is a set of

1 questions. I want to understand about some
2 of the earlier well-kill attempts and if
3 those could have damaged the well or hurt the
4 chances of the later well-kill attempts
5 succeeding.
6 So once the first well-kill attempt
7 didn't work, how did that impact the second
8 well-kill attempt?
9 WITNESS WALZEL: A Well, the first
10 one, I don't remember how many barrels we
11 pumped total. As I recall, we shutdown. I
12 recall we shutdown early, and regrouped to
13 talk about it because things weren't going
14 as, you know -- to talk about what we seen
15 before continuing on.
16 Q Okay.
17 A And then on the second one, you
18 know, I think the fluid weights stayed the
19 same. I mean, I don't think we changed fluid
20 weights because we had already come up with
21 that number. There was Barite pill that was
22 going to be pumped at the end, and maybe
23 those volumes changed. Maybe one time we
24 didn't pump a Barite pill, but as far as
25 hurting the well, you know, I didn't see
26 anything from -- from pump pressures or
27 anything to say that anything within the well
28 changed. The only thing that changed was the

1 area, the area around the well.
2 You know, initially there was just
3 gas, you know, coming, you know, various
4 places around the pad. And then after one of
5 those pumped jobs -- might have been the
6 second one, but, anyway, all the gas was
7 coming up around the well, and blew the dirt
8 up from around the well, and we had to go
9 secure the well to keep it from -- stable
10 and, but that was the only thing I observed
11 to change was the area around the well.
12 Q When you observed the change in the
13 area around the well, was that after the
14 first Boots & Coots' well-kill attempt?
15 A I don't recall if it was after the
16 first or maybe the second one.
17 WITNESS KOPECKY: A I agree.
18 Q You agree?
19 WITNESS KOPECKY: A What I mean is I
20 don't recall if it was the first or second
21 well-kill attempt when the ground
22 deteriorated.
23 Q I see. Okay. Do you have any idea
24 why the ground deteriorated after the first
25 or second well-kill attempt?
26 WITNESS WALZEL: A I mean, I can't --
27 I can't say why, other than we were pumping
28 fluid in there at, you know, whatever rate we

1 were pumping, you know, and it'd circulate
2 mud up, and, you know, it's going to the path
3 of the least resistance and made its own
4 path.
5 Q Anything?
6 WITNESS KOPECKY: A I agree.
7 MR. SHER: Clarification?
8 MR. GRUEN: Okay.
9
10 EXAMINATION
11 BY MR. SHER:
12 Q Does that mean as your pumping down
13 through the well, the fluids are escaping at
14 some point from the tube where maybe there's
15 a hole where the gas was going out and that's
16 coming -- that's causing erosion around the
17 well?
18 WITNESS KOPECKY: A Well, it was
19 coming to the surface, some of your fluids.
20 Q Okay.
21 WITNESS KOPECKY: A Not all would
22 come.
23 WITNESS WALZEL: A Right. There's no
24 way to tell like we pumped 800 barrels and we
25 got 600 back because the return for his
26 company. Out and around the well, there was
27 no way to measure.
28 WITNESS KOPECKY: A No time --

1 WITNESS WALZEL: A No way to measure.
2 WITNESS KOPECKY: A -- capture.
3 WITNESS WALZEL: A Losing to the
4 formation.
5 Q I went down to the wellsite and
6 there was just a big hole and lots of oil
7 residue and so forth. So the liquid that was
8 getting pumped was coming up and caught in
9 that earth around --
10 WITNESS KOPECKY: A Yes, sir.
11 WITNESS WALZEL: A Right. We were
12 pumping down the tubing, and it was coming
13 out of the tubing because we did set a plug
14 in the tube and then perforated it; so it was
15 going out the perforations, up the casing,
16 and then exiting wherever the hole was in the
17 casing.
18 MR. SHER: Okay. Thank you.
19
20 EXAMINATION (resumed)
21 BY MR. GRUEN:
22 Q What do you think -- what did it
23 look like was coming out of the ground?
24 WITNESS WALZEL: A The fluids we were
25 pumping in and gas.
26 Q Okay. How far were they going when
27 you were out there looking at them coming
28 out?

1 WITNESS WALZEL: A How far was what
2 going?
3 Q The fluid and the gas.
4 WITNESS WALZEL: A The fluid was, if I
5 recall, it was coming up from around the well
6 and then there was some trenches, catch pits,
7 and it was going there and they were
8 collecting it from there.
9 Q Was it shooting up into the air or
10 was it just kind of running along the ground?
11 Or what did look like?
12 WITNESS WALZEL: A with the gas, it
13 was -- I don't have a word to describe it,
14 but there was some mud coming up.
15 WITNESS KOPECKY: A Right.
16 WITNESS WALZEL: A As you're pumping
17 the gas you're -- the activity of the gas
18 because you're pumping on it, but just the
19 gas breaking out through the mud. It was
20 coming up out of the cellar. Call it the
21 cellar there around the well.
22 WITNESS KOPECKY: A Percolating, kind
23 of.
24 Q Okay. Okay. All right. So I
25 think just running through those from maybe
26 the second to the third - let's say - I think
27 you mentioned, Mr. Kopecky, three to five
28 attempts. I'll assume just for the sake of

1 asking questions - and maybe I'm not quite
2 right - it's maybe five attempts, and just
3 for purposes of asking you what you noticed
4 in terms of the changes from the second to
5 the third attempt, to the third to fourth,
6 and the fourth to fifth. Does that make
7 sense?
8 So I'm just trying to get a sense
9 of how things -- what impacts to the well the
10 second attempt had, for example.
11 So anything that you noticed that
12 was changing or damaging the well from the
13 second --
14 WITNESS KOPECKY: A Well, as Danny
15 mentioned, we didn't notice any changes to
16 the well, and, of course, my changes would be
17 visually because I was located at the well.
18 The only changes that were noted
19 were the cratering of the location around the
20 well. And, again, I think -- I think there
21 were probably -- I said three to five. I
22 really think it may have been four, but I'm
23 not sure, but I think it was probably after
24 the second that we had to move our pump
25 equipment and all further up the hill to get
26 it off the location because it was deemed
27 unstable, if you will. We didn't know how
28 much erosion was going to continue on the

1 next kill attempt; so we just physically had
2 to move everything.
3 Q Did you notice the cratering
4 continue as you moved to the later attempts,
5 to the third and fourth attempt?
6 WITNESS WALZEL: A Well, after each,
7 you know, after each attempt, the crater
8 might have grew just a little bit because,
9 you know, you're introducing liquids, and,
10 you know, its going to erode more than just
11 if it's gas. So, you know, the crater got a
12 little bigger each time.
13 Q How did that change what you did in
14 terms of the kill attempts as the crater
15 grew?
16 WITNESS KOPECKY: A Well, we -- and I
17 don't recall if it was after the first kill
18 attempt, but we strengthened the catch pits
19 and got equipment in to create more berms, if
20 you will, more levies to direct any flow we
21 had from the pumping. And, of course, we
22 had, you know, extensive monitoring, gas
23 monitoring, and I don't know if that covered
24 everything.
25 WITNESS WALZEL: A Yeah. And also
26 in-between whether it was the first and
27 second or the second to third, we had to
28 get -- well, we got all the logging tools,

1 you know, the logging equipment to run the
2 noise tamp and the spinner, and we attempted
3 a gyro. We ran a gyro, too, and that was
4 for, you know, if we lost the well, we would
5 have an accurate survey for the relief well
6 drill, you know, as a contingency.
7 And before the -- it was after one
8 of those kill attempts, you know, we had, you
9 know, fluid in the tube. And, anyway, ice
10 formed a plug in the tube. And so we had to
11 get a cold tube and heat it to go through the
12 ice plugging, or the ice had formed in the
13 tube so we could gain access to run our logs.
14 MR. SHER: Would ice have formed
15 because of the cooling gas?
16 WITNESS WALZEL: A Correct.
17 MR. GRUEN: Q So was ice forming --
18 was more ice forming in the later well-kill
19 attempts compared to the earlier ones?
20 WITNESS WALZEL: A I don't -- there
21 was only one time we had to get ice out of
22 the tubing. Now, whether there was anything
23 different going on, I can't say other than
24 after the second attempt or third attempt,
25 there was still a column of fluid in the tube
26 and that froze.
27 Q Okay.
28 WITNESS WALZEL: A You know, after all

1 the other ones, all the fluid might have left
2 the tubing and there wasn't any liquid left
3 to freeze there.
4 Q Anything you want to add,
5 Mr. Kopecky?
6 WITNESS KOPECKY: A No.
7 MR. BRUNO: Darryl, if I may?
8 MR. GRUEN: Yes.
9 EXAMINATION
10 BY MR. BRUNO:
11 Q Did SoCalGas indicate any ice plug
12 before your arrival or once you got on board
13 before the first Boots & Coots' well-kill
14 attempt?
15 WITNESS KOPECKY: A Not to my
16 knowledge.
17 WITNESS WALZEL: A I don't recall any
18 discussions about ice plugs.
19 Q Am I right to gather that the --
20 it's the kill fluid that froze with the
21 combination of the leak?
22 WITNESS KOPECKY: A It could have been
23 kill fluid and well-bore fluid.
24 WITNESS WALZEL: A Right. After one
25 of the pump jobs, you know, the only thing
26 that would have been in the tubing would have
27 been the fluid we pumped; so it would have
28 been the kill fluid.

1 Q Okay. And then if I may, I think
2 Mr. Gruen hit on this, but the erosion that
3 occurred around wellhead, your kill attempts,
4 your subsequent kill attempts, those weren't
5 modified; right?
6 You moved equipment and whatnot,
7 but you didn't have to change your procedures
8 or did you do anything different that absent
9 erosion you wouldn't have done?
10 In other words, did you execute the
11 optimal plan that Boots & Coots wanted to?
12 WITNESS WALZEL: A Yes.
13 Q Did you have everything you needed
14 to do at your job?
15 WITNESS WALZEL: A Yes.
16 Q And that includes all the
17 information from SoCalGas; did you have all
18 the information you needed from SoCalGas?
19 A Yes.
20 Q What about real time information;
21 in other words, from the first kill attempt
22 and subsequent, just talk about what you're
23 learning a little more. I think you said you
24 shutdown at one point and you had a
25 conversation?
26 WITNESS WALZEL: A Right.
27 Q That appears to be typical. Like
28 you would -- real-time information you would

1 incorporate that into your plan; am I right
2 in assuming you incorporate everything; in
3 other words, what went wrong on the first one
4 and how do we adjust the second one?
5 WITNESS WALZEL: A I mean, nothing
6 went wrong, you know. Just the observations
7 of, you know, when we pumped mud down the
8 tubing, it -- we got it back. You know, we
9 could see it coming out of the well way
10 before it was expected to.
11 You know, the time that it took for
12 mud -- I call it good returns, but a good
13 amount of returns coming back from the well.
14 That came a lot later than what we figured;
15 so, you know, it was just observations like
16 that. And then one time we pumped down the
17 anulus, and all we -- we tried to pump
18 plugging material. We got it back right --
19 and it came right out of the ground.
20 Those were just the observations
21 that we saw, you know, and any real time we
22 would have pump pressures.
23 Q And all the real-time information
24 you just described, had you seen something
25 like that before on a natural gas reservoir
26 storage feel?
27 A A blowout?
28 Q Just the conditions, not exactly

1 matching what had you anticipated.
2 WITNESS WALZEL: A Oh, every job is
3 that way.
4 Q So there was nothing really
5 different then about SS-25; the kill attempts
6 I'm talking about.
7 WITNESS WALZEL: A I mean, not it
8 comparing to others, but, you know, a lot of
9 time you don't know the whole -- what the
10 pieces of the puzzle are down below the
11 ground until you kill the well. So a lot of
12 times its, you know, running your logs. It's
13 a process of elimination -- not elimination.
14 You try one thing, okay. Try something else,
15 and, you know, so but -- I mean, it looked
16 just like any gas release from an oil well.
17 Q And that's true all the way from
18 the beginning to the last kill attempt?
19 A Yes.
20 EXAMINATION
21 BY MR. SHER:
22 Q With regards to the formula that
23 was used to figure out how much weight or
24 pressure you could push down the kill
25 materials, does that make sense?
26 WITNESS WALZEL: A That wasn't a
27 formula, just the wellhead has a pressure
28 rating of 5,000 PSI.

1 Q So then in order to figure out the
2 mud weight, there a formula one uses that has
3 inputs. You talked about the pressure, the
4 length of the column.
5 Does one take a look at the inputs
6 after different kill attempts to see maybe if
7 our inputs were not right, and by "our
8 inputs" I mean SoCalGas inputs.
9 WITNESS KOPECKY: A You mean like by
10 the depth of the well or something of that
11 nature?
12 Q Yes. You stopped your meeting
13 early because the first well-kill attempt
14 didn't work and you break and have a meeting
15 and I'm assuming everyone is brainstorming as
16 to, Okay, it didn't work. What do we think
17 we need to do next to try and kill the well.
18 Does one relook at the data that was inputted
19 into that formula?
20 WITNESS WALZEL: A Well, I mean, the
21 reservoir pressure wouldn't have changed, you
22 know. I mean, it was -- decreased slowly
23 over the whole time we were there; so it
24 wouldn't have changed, and they would keep
25 the record of what the pressure in the
26 reservoir was the whole time.
27 Q And then the amount of gas in the
28 column, would that have been a variable that

1 would change as one factor?
2 WITNESS WALZEL: A In the block well
3 or just the normal -- or just another well in
4 the field that they might have been reading
5 pressure off of?
6 Q Let's go with SS-25 and the blowout
7 well. What would you expect the amount of
8 gas in the column, that figure that gets
9 inputted into the formula, to change over
10 each well-kill attempt or would you expect
11 that data to remain the same?
12 WITNESS WALZEL: A Well, yeah, the
13 column in -- if it would have been SS-25, it
14 would have been the gas blowing out, you
15 know, from whatever hole and that would be
16 dependent on the, you know, if the flow path
17 changes or if the reservoir pressure
18 decreases, and there's a lot of variables in
19 that. I was just talking about the column of
20 gas in a static well.
21 You know, if you have a pressure,
22 you know it's 100 percent gas, you calculate
23 the reservoir pressure, but, I mean, yeah,
24 the amount of gas flowing, I mean, it
25 wouldn't have been constant every second of
26 every day.
27 Q And please understand, I think, for
28 all of us none of our questions are meant to

1 undercut or question your professionalism and
2 expertise and experience. It's not our
3 intent. We are trying to understand what
4 happened, we're lay people.
5 So to me what I'm hearing is that
6 because every well is different, the basic
7 formula may not work. If your inputs are
8 completely different, how do you figure
9 out -- I'm sorry if I'm muddling things here.
10 If you couldn't -- I apologize,
11 guys.
12 MR. GRUEN: Take your time.
13 MR. SHER: Q The relief well
14 ultimately stopped the leak; correct?
15 WITNESS WALZEL: A Correct.
16 Q In your experience working on
17 natural gas storage fields that have once
18 been oil production fields, to the degree
19 you've had other experience --
20 WITNESS WALZEL: A Uh-huh.
21 Q -- with blowouts, was SS-25 unique
22 in that you couldn't stop that -- one could
23 not stop that from the top?
24 WITNESS WALZEL: A Can you repeat
25 that?
26 Q Sure. The understanding that every
27 field is different and that even wells on a
28 lease may be different, different geology, et

1 cetera, but I would expect that generally the
2 Boots & Coots of the world, the Halliburtons,
3 the folks that have experience killing wells
4 are generally successful because we don't
5 have all these wells all over the world that
6 are leaking as far as we know, but in this
7 instance, it took a number of attempts to try
8 and do a top kill and it just didn't work.
9 WITNESS WALZEL: A Right.
10 Q So in looking back, why do you
11 think the top kills didn't work?
12 WITNESS WALZEL: A Well, I mean, they
13 didn't work because we weren't able to get
14 enough hydrostatic in the well bore to be
15 equal to or higher than the reservoir
16 pressure, you know.
17 It comes down to was, you know, the
18 gas velocity exiting well bore, we couldn't
19 overcome with the limitations that we had for
20 pump rates, which were tied to our pressure,
21 which is tied to the wellhead equipment, and,
22 you know, there was still a lot of unknowns
23 at that time: Where the hole might be;
24 what -- where the gas was coming into the
25 well and leaving the tube, and, you know,
26 there's still some unknowns, but it all comes
27 down to, could we pump fast enough and not
28 exceed our pressures of the wellhead.

1 Q Based on the experience of SS-25
2 and understanding limitations that the
3 wellhead was only able to take 5,000 PSI, for
4 example, would a future remedy, if we're
5 thinking about future remedies and trying to
6 prevent these kinds of leaks requiring a
7 wellhead that could take 10,000 PSI? Would
8 that be something as a remedy you guys might
9 suggest?
10 WITNESS WALZEL: A I mean, I can't --
11 WITNESS KOPECKY: A We can't honestly
12 say or say at all that had we been able to
13 pump at a higher rate we would have been
14 successful. We're not sure. We weren't able
15 to.
16 Q Part of what we need to do as a
17 Commission is figure out how we prevent these
18 kinds of leaks in the future. So we don't
19 have the kind of expertise you do, and so it
20 would be very helpful for us to understand
21 maybe we need to require our gas operators to
22 have equipment that can take a different pump
23 rate.
24 Does that make sense to you?
25 WITNESS WALZEL: A I mean, there was
26 already a hole somewhere; so, you know, I
27 can't really comment on, you know, high
28 pressure wellheads, but, you know, the

1 wellhead was five. The casing, you know,
2 whatever. You just don't look at the
3 wellhead. It's the casing, design and
4 everything. So you know, I don't really know
5 if I can comment on that.
6 EXAMINATION
7 BY MR. BRUNO:
8 Q Mr. Walzel, what about reservoir
9 pressure itself?
10 WITNESS WALZEL: A Uh-huh.
11 Q Had you -- was the reservoir
12 pressure that you were given was that
13 different in any way or is that the pretty
14 standard typical pressure you might -- was it
15 extraordinary the pressure?
16 WITNESS WALZEL: A No. No.
17 WITNESS KOPECKY: A No.
18 WITNESS WALZEL: A I mean, I'm not
19 a -- I don't have any history of the rock
20 mechanics of the reservoir. As far as the
21 pressure, it didn't seem out of the ordinary.
22 Q And the pressure is proportional to
23 the working gas inventory?
24 WITNESS WALZEL: A Yes. The more gas
25 in there, the higher pressure you're going to
26 have.
27 Q So given, for instance, 86 billion
28 cubic feet of gas, which, I believe, is the

capacity at Aliso working gas. If you cut that in had half and you're down to 43 or give or take BCF, am I correct that a leak at that reservoir pressure would be -- would it be easier to develop a hydrostatic head to --

WITNESS WALZEL: A If it's a lower pressure, yes.

Q Okay.

A Dependent on -- you know, still dependent on the exit velocity, gas velocity coming out of the well bore, too, but, yes, if the reservoir pressure, it will take lighter fluid, you know.

Q If I may, you know, just to make sure I understand, going back to that first kill attempt with the known reservoir pressure, your team had everything they needed on paper to overcome that pressure?

A Yes. If -- if -- I mean, we still didn't know how the flow rate of the gas coming out, but, you know, it was sufficient fluid, and, again, we pumped on it, but you're still limited to the pump rate, you know.

Q How does one determine the flow rate in a blowout?

A Well, there's a lot of complex equations, you know. There's still a lot of

1 unknowns in the well bore. Where it's
2 exiting, but, you know, theoretically it
3 would be reservoir properties and pressures
4 -- reservoir properties, you get absolute
5 open flow.
6 Q So the flow rate deter- -- I guess
7 a number of factors can influence the flow
8 rate? Path of the gas if its changing?
9 A Right.
10 Q Is it possible to apply some
11 advance formula to get at the flow rate, if
12 you will, to make -- make a best estimate?
13 A Yeah, like I said, they all
14 calculate -- you can find an absolute open
15 flow rate. You know, that number right be in
16 the ballpark, might not be. There's so many
17 other variables that you don't -- there's lot
18 of blocks we don't even know what the -- you
19 know, what it's actually flowing until you
20 put it -- cap it and put it in diverter lines
21 and get pressures and whatnot.
22 That would have been the most --
23 that's one way we could figure it out if it
24 was 100 percent gas or whatever, but, you
25 know, still at the end of the day, it's -- if
26 we're going to pump, this is how fast we can
27 pump, and you know.
28 Q Right. So did Boots & Coots

1 calculate a flow rate?
2 A I don't recall if we did, or it was
3 given to us, you know. I didn't calculate
4 one.
5 Q Did Mr. Clayton, perhaps, calculate
6 one?
7 A No.
8 Q Would it be common for the
9 owner-operator to give you that piece of
10 information?
11 A Yeah, sometimes.
12 Q Again, my understanding is this is
13 something you calculate.
14 Let me back up. If there's no leak
15 and you're just flowing gas, you can
16 calculate a flow rate?
17 A Yeah, you'd a choke, and you'd go
18 through a choke, and you'd have upstream and
19 downstream pressure and choke size.
20 Q In that same situation, when you
21 have a leak and it finds a new path, you have
22 a different flow rate?
23 A The hole size is different.
24 Q So all those variables would affect
25 it.
26 A Right.
27 Q So that would have been something
28 that SoCalGas would have had to calculate

1 after the blowout?
2 A To get an estimate of the -- right.
3 Yeah. I mean, to get an accurate -- I say
4 accurate. To get another estimate of the gas
5 flow rate.
6 Q And that is a mathematical equation
7 or is that a physical measurement?
8 A It would be a calculation, you
9 know. You could physically do it if you
10 could put it in a pipe line and get two
11 pressure ratings and you know your pipe size,
12 you know, but we weren't able to do that.
13 Q So sort of a fixed volume and then
14 calculate --
15 A It would be more of a fixed area
16 and length of flow in it and a pressure drop,
17 and you could get a calculation on.
18 Q Got it.
19 Do you know if that was done by
20 SoCalGas at least or would that help you at
21 all?
22 A It was impossible.
23 Q Okay. So then you're limited to a
24 mathematical estimation?
25 A Right.
26 Q Do you know if that was done by
27 SoCalGas?
28 A I can't say if it was or if it

1 wasn't.
2 Q Okay. How was -- if I may, how was
3 the morale of the Boots and Coots kill team
4 over time, the first kill attempt, the second
5 first kill attempt, I mean, or the team
6 becoming discouraged or is it just par for
7 the course?
8 A No. I don't think -- there wasn't
9 any -- morale stayed high, the same. Yeah,
10 it's frustrating that it didn't die, but it
11 didn't affect our --
12 WITNESS KOPECKY: A Work duties.
13 WITNESS WALZEL: A -- morale.
14 Q Okay. Then when the decision was
15 made for a relief well, was it understood
16 amongst the team that you tried everything in
17 your arsenal and that was the next step?
18 WITNESS WALZEL: A Right. Yes. It
19 was the next step. It was the right
20 decision. You know, we tried. We don't want
21 to make it any worse here; so let's drill a
22 relief well and intercept at the bottom of
23 the well.
24 Q Yes, sir. I understand. Thank
25 you. What about mechanical valves on the
26 well? Did Boots & Coots check to see if
27 there were any subsurface safety valves on
28 the well as part of the planning?

1 WITNESS WALZEL: A I mean, we would
2 have looked at the well design and note it.
3 If it was in the well design, then it would
4 have been in the well, you know.
5 WITNESS KOPECKY: A To my
6 recollection, there was no subsurface safety
7 valve.
8 Q That's consistent with my
9 understanding too. I guess, my question is,
10 had SS-25 had a subsurface safety valve,
11 would you have attempted to use that before
12 first top-kill attempt?
13 WITNESS WALZEL: A Well, the safety
14 valve would have been in the tubing, and the
15 problem was on the casing, and so shutting it
16 on the tubing wouldn't have affected the gas
17 exiting on the casing.
18 Q Is there a valve -- is there any
19 type of valve, based on your experience, that
20 would have been effective had it been
21 designed in?
22 WITNESS KOPECKY: A No.
23 WITNESS WALZEL: A No. Not to prevent
24 a leak in the casing.
25 EXAMINATION
26 BY MR. SHER:
27 Q Question on that: So we have the
28 reservoir at the bottom about 8,000-odd-feet

1 deep, and then we have the casing, and inside
2 the casing we have the tubing; is that
3 correct?
4 WITNESS WALZEL: A Correct.
5 Q Is it normal for gas to come up the
6 casing, or does gas come up the casing
7 because the owner-operator is using both to
8 withdraw?
9 WITNESS WALZEL: A Depending on the
10 designs, but, I mean, we've seen, you know,
11 different parts of world that have high
12 production. They'll produce from the casing
13 and tubing, or, you know, there's no set
14 design rule, I guess.
15 Q With regards to SS-25, do you know
16 whether the owner-operator was using both the
17 casing and the tubing to withdraw or inject?
18 WITNESS KOPECKY: A I believe both.
19 WITNESS WALZEL: A Yeah. I mean, I
20 believe it was both.]
21 Q And I really appreciate -- we
22 didn't understand the safety valve would only
23 be on the tubing. So I really appreciate
24 that information.
25 A Right.
26 Q Just on that note, just to make
27 sure I understand and drill this into my
28 head, if you had a subsurface safety valve on

1 SS-25 and you were flowing through the tubing
2 and the casing, it would not be effective.
3 A It wouldn't have prevented the gas
4 from exiting the wellbore in this case --
5 scenario. The subsurface safety valve is in
6 the tubing. So say your wellhead gets
7 knocked off or your tree gets knocked off,
8 you know, you shut it and it's done, but if
9 it's exiting somewhere else in the well, it's
10 not going to --
11 WITNESS KOPECKY: A And it's typically
12 not located very deep in the tubing string.
13 Q In your experience, can you give an
14 idea of where you find them, if you can?
15 A I want to say 200 to 700 feet.
16 Q Okay.
17 A Best recollection.
18 Q So once an operator is -- decided
19 to flow through tubing and casing, there is
20 no mechanical equipment to not -- to mitigate
21 the consequences of a leak -- in other words,
22 once a leak happens or a blowout happens,
23 there is no mechanical valve or anything that
24 could shut that in, if you will? It's
25 basically top kill or relief well at that
26 point?
27 A I don't recall if the well had a
28 packer.

1 MR. SHER: Q what is a packer? Is it
2 P-A-C-K-E-R?
3 WITNESS WALZEL: A Yes.
4 WITNESS KOPECKY: A P-A-C-K-E-R.
5 WITNESS WALZEL: A Like when you run
6 tubing, there's a packer that goes around the
7 tubing and seals off between the casing, but
8 I don't recall if there was a packer or not
9 but -- how they were -- how it would have
10 been flowed both ways. But a packer would
11 just seal off around the tubing and the
12 casing. So then all your flow, if you have
13 integrity, is just up and down the tubing.
14 Q Does one install the packer when
15 one drills the well?
16 WITNESS KOPECKY: A No.
17 WITNESS WALZEL: A No.
18 Q So can you install a packer at any
19 point in the life of the well?
20 A Well, there's packers you can run
21 in casing and storm packers, test packers.
22 Yeah. I mean, there is bridge plugs and
23 stuff, but you know, their application, it
24 wouldn't be --
25 WITNESS KOPECKY: A It would be
26 installed during the completion phase or
27 work-over phase.
28 WITNESS WALZEL: A Yeah, the tubing

1 packer would have been, yeah.
2 Q I'm sorry. And the packer would,
3 in the case of Aliso, may be as deep as
4 8,000. So it's close to the bottom weight
5 reservoir?
6 WITNESS WALZEL: A Right.
7 MR. SHER: Thank you.
8 MS. ROSE: Would having a packer in the
9 well preclude you from using the casing to
10 extract gas?
11 WITNESS WALZEL: A Not necessarily.
12 It depends on your tubing design, you know,
13 if you have a sleeve you can open or close,
14 you know. Yeah, I mean, if there wasn't any
15 sleeve, but typically, there's a sliding
16 sleeve or something in there for various
17 reasons, but yeah. No, it wouldn't a hundred
18 percent isolate them.
19 MS. ROSE: Okay.
20 MR. SHER: Q Have people, just in
21 general, talked to you guys based on your
22 experience and expertise in -- whether it's
23 offering you a chance to give a training or
24 one of these classes that you guys take to
25 keep up to speed with what's going on in the
26 industry. Because you guys have tons of
27 experience. So are you able to offer advice
28 as to -- to owners and operators or

1 regulators as to how to be as safe as
2 possible in your well design so you can avoid
3 leaks?
4 A Well, I mean, we've been asked, you
5 know, by operators to come in and look at
6 fields or whatever and give advice on, like,
7 if there are drilling wells in urban areas.
8 We've given advice on that. Or if we're
9 asked to speak on a topic, then, yeah, we do.
10 WITNESS KOPECKY: A Or which they do a
11 lot nowadays is multiple well pads. They
12 invite us out at times to give them
13 recommendations on the layout in -- to reduce
14 the chance of multiple wells on fire at one
15 time, that type of thing.
16 EXAMINATION (resumed)
17 BY MR. GRUEN:
18 Q A follow-up on the flow rate you
19 were talking about earlier. I get you. It
20 sounds like if it's short of it being a
21 static well you may have some uncertainty
22 about what the flow rate is? Did I get that
23 part right?
24 WITNESS WALZEL: A Right. Yes.
25 Q Thank you. So I also understood
26 you had mathematical estimations in the case
27 of SS-25 because you obviously don't have a
28 static situation there, right? Did I get

1 that part right?
2 A Yeah. When I said mathematical, a
3 lot of times a number will be calculated with
4 this pressure, this tubing and casing design.
5 If the wellhead gets knocked off, this is how
6 much gas theoretically will come out.
7 Q Yeah. And would you expect that
8 number to change over time after an
9 unsuccessful well-kill attempt?
10 A It will change over time if the
11 reservoir pressure changes.
12 Q Here, SoCalGas was -- I think you
13 said SoCalGas was reducing reservoir
14 pressure?
15 A Yes. They were.
16 Q So that was being counted for in
17 the change of the flow rate calculation?
18 A Yes. I mean, if you were to
19 calculate, yeah, it would be used. Yeah.
20 Q You recall getting changes in the
21 flow rate calculations based on the change in
22 the reservoir?
23 A I mean, it wasn't calculated --
24 it's not something that would have been
25 calculated daily or hourly -- I mean, since
26 know one knows how much was coming out to
27 begin with.
28 Q Yeah. I get you. I get you. So

1 what about too just with the gas escaping
2 through the crater and that changed -- that's
3 a change too just in terms of you go from one
4 well-kill attempt to the next? How -- if at
5 all, how would that change the flow rate
6 calculation?
7 A I'm not following.
8 Q If you're not following it, it
9 probably means I'm not getting it right. So
10 just really quickly would the flow rate --
11 would you expect the flow rate to change
12 after the first well-kill attempt?
13 A I wouldn't expect it to change much
14 at all. I mean, the reservoir pressure
15 hasn't changed probably hardly at all, you
16 know, in a day. The gas just -- there was
17 more gas coming up around the well as opposed
18 to coming out little cracks elsewhere.
19 So ...
20 Q Just for the sake of discussion,
21 what if the reservoir pressure stayed the
22 same?
23 A If nothing in the wellbore changes,
24 then flow rate would stay the same.
25 Q So if something in the wellbore
26 changed -- could something in the wellbore
27 change after the first well-kill attempt?
28 A Not to my knowledge. The only

1 thing that changed was the earth around the
2 well.
3 Q So that's not the same thing --
4 could that -- did you have a concern that
5 that meant the wellbore casing -- that the
6 wellbore was changing because of the change
7 in the earth?
8 A No. No.
9 MR. GRUEN: Did I -- do you want to
10 follow-up on that?
11 EXAMINATION
12 BY MR. BRUNO:
13 Q Yeah. Well, I just want to ask
14 generally, in your opinion, being out there,
15 did the leak change like -- or just the path?
16 Do you think that more gas was coming out
17 after the first well-kill attempt over time?
18 Did the leak get worse? Did the blowout get
19 worse?
20 A I can't say it got worse or better,
21 because originally it was going out and
22 coming up in several places, you know.
23 Q Sure.
24 A After it -- the crater formed
25 around the well, all that stopped, and it was
26 all coming up around the well. Whether that
27 was more or less, I can't say.
28 Q So the path changed --

1 A It was isolated. It was all
2 contained in one area instead of coming up in
3 several areas. You know.
4 MR. BRUNO: Right. Okay. Thank you.
5 Thank you, sir.
6 EXAMINATION (resumed)
7 BY MR. GRUEN:
8 Q Just a couple of questions about
9 what was in the well during the attempt. So
10 I think you had mentioned mud and perhaps
11 brine being used?
12 A Mm-hmm.
13 Q One of the things we had looked at
14 was something about a junk shot?
15 A Yes.
16 Q Can you talk about that? Was that
17 used, and if so, what was in it?
18 A Right. So a lot of times we'll
19 pump a junk shot, which is junk -- rope, golf
20 balls --
21 WITNESS KOPECKY: A Rubber.
22 WITNESS WALZEL: A Rubber. Just
23 plugging material. That day, when we did
24 that, we tried -- we did pump it down the
25 casing in an attempt to plug the hole in the
26 casing, but I don't know how much -- how many
27 we did, but I mean, we pumped golf balls and
28 big materials just down the casing. As soon

as we pumped it, it was already shooting out of the ground, meaning it's exiting more to the surface of the well probably. We were getting it back really quick.

MS. ROSE: The golf balls?

WITNESS WALZEL: A Golf balls.

WITNESS KOPECKY: A So we determined that the hole was at least -- well, it also let us know that the hole was at least the size of a golf ball.

WITNESS WALZEL: A Right.

MR. GRUEN: Q Yeah. I follow your logic there. Any indications could you get from the junk shot of how big the hole was --

WITNESS KOPECKY: A No.

Q -- aside from that? Okay.

I guess the other thing I'm gathering is sometimes a junk shot works?

WITNESS WALZEL: A Oh, yes.

Q How often -- how many junk shots did you try?

A I can't -- I can't recall the specific number, but we'd pump several -- we loaded it several times that day, but I mean, we just couldn't get anything to plug the hole. The idea would be to plug the hole, keep pumping down the casing into the well, but nothing was plugging the hole.

1 Q Yeah. I follow you. Okay. And
2 after the junk shot didn't work -- or the
3 junk shots -- maybe I guess it was a couple
4 times. Did that change how you tried to kill
5 the well after that?
6 A No.
7 Q Okay. So you're back to mud or
8 brine at that point?
9 A Right.
10 Q One thing in our notes too -- I
11 think we just wanted to clarify, and I want
12 to echo Nicholas. We're not -- this is
13 respect for your professionalism today and
14 the answers you've given us. We're not
15 trying to undermine it in asking this. We're
16 trying to just understand, as lay people,
17 what happened.
18 So I note that it's three years
19 ago. I'm just going to raise this. One
20 thing in our notes is that there was another
21 well-kill attempt. It looks like there was a
22 top well-kill attempt on December 22nd or so.
23 Does that ring a bell -- or maybe our notes
24 are wrong. It could well be.
25 A I wasn't there, but I don't recall
26 ever hearing about another one on -- that
27 late.
28 Q Okay.

1 A Unless that was -- I don't even
2 remember what day it got intercepted or --
3 no. I don't have any knowledge of one on
4 December 22nd.
5 Q Understood. Thank you.
6 WITNESS KOPECKY: A I was already -- I
7 was on another job, and I had lost contact
8 with anyone affiliated with it. So I'm not
9 aware of it.
10 Q That's helpful.
11 EXAMINATION
12 BY MR. BRUNO:
13 Q Who relieved you from Boots &
14 Coots? Was there another --
15 WITNESS KOPECKY: A Yes, my
16 recollection it was Juan Moran.
17 Q Would you mind spelling that, sir,
18 or is it "Marin"?
19 A Let me make sure it Moran -- it was
20 Juan Moran or Travis Martel. I don't recall
21 which, but -- spell it? Is that what --
22 Q I was just trying to make sure I
23 understood the pronunciation.
24 A J-U-A-N M-O-R-A-N or Travis Martel,
25 M-A-R-T-E-L, and I don't recall which one
26 relieved me.
27 Q Thank you, Mr. Kopecky, and Mr.
28 Walzel, how about yourself? Were you

1 relieved by any Boots & Coots employees?
2 WITNESS WALZEL: A I was relieved --
3 there was Jim LaGrone and Rolly Gomez were
4 engineers for Boots & Coots after I left to
5 help with the relief well and activities at
6 SS-25.
7 Q Okay. Thank you, sir. J-I-M
8 L-A-G-R-O-N-E, R-O-L-L-Y G-O-M-E-Z.
9 MS. ROSE: And do you know if
10 Mr. Clayton stayed on, or was he also
11 relieved?
12 A He came home and then went back.
13 WITNESS KOPECKY: A And I do recall --
14 now that I mention it, I believe Travis
15 Martel relieved me, and Juan Moran, as the
16 senior well control specialist, I believe,
17 relieved Danny. And then Richard was in
18 there at some point.
19 WITNESS WALZEL: A Richard was there.
20 I believe Richard was -- relieved Danny.
21 MR. GRUEN: Can we seal the record.
22 EXAMINATION (resumed)
23 BY MR. GRUEN:
24 Q One thing -- I have an invoice here
25 that mentioned the two of you and Danny
26 Clayton and then Mike Baggett as well?
27 A Yes. He was our safety
28 representative.

1 Q Okay.
2 WITNESS KOPECKY: A I don't know at
3 what point we bought him, but it had to be
4 pretty quick.
5 WITNESS WALZEL: A It was quick. He
6 wasn't on the plane coming out with us, but
7 he arrived shortly thereafter.
8 Q How long was he with you?
9 WITNESS KOPECKY: A He was there when
10 I left.
11 WITNESS WALZEL: A He was there when
12 you left, but then there was a -- Patton came
13 and relieved him.
14 WITNESS KOPECKY: A Then he came back.
15 WITNESS WALZEL: A Then he came back.
16 So -- and I think he stayed pretty much for a
17 majority of the project.
18 MR. GRUEN: Let's take the seal off the
19 record for a second.
20 Q I'm going to ask you the same
21 question. Can you tell me how long Mike
22 Baggett stayed with you?
23 A I don't have a number of days.
24 Q Approximately. I'm asking the same
25 question as before.
26 A A month.
27 Q Okay.
28 A But then I believe he was there --

1 I was there a month, so he was there with me
2 probably about a month.
3 Q Okay. All right. And as safety
4 officer, what was his role?
5 A His main -- his role is to look out
6 after us. A lot of times companies we work
7 for don't want their personnel in the hot
8 zone. So as we're in the hot zone, then he
9 would be there for us and then also to work
10 with the customer and explain if we're doing
11 something a certain way that might not be
12 normal -- I'd say normal, explain why we're
13 doing it, enforce -- he was also there to
14 check people in and out of location and keep
15 track of the personnel on location.
16 Q Okay.
17 WITNESS KOPECKY: A Correct.
18 Q Thank you. Anything --
19 WITNESS WALZEL: A And gas monitoring.
20 He also would check the gas levels.
21 WITNESS KOPECKY: A One direction.
22 WITNESS WALZEL: A One direction. He
23 would actually be the first one to go up
24 every morning and check the LELs one
25 direction and permit the cranes to move in
26 and stuff like that.
27 WITNESS KOPECKY: A There would always
28 be two of us would go up --

1 WITNESS WALZEL: A Right, yeah.
2 Q I follow. Who else was -- if
3 anybody -- was it the four of you then? Was
4 there anyone else on the Boots & Coots team
5 during the -- when you both were there
6 on-site?
7 WITNESS KOPECKY: A Not to my
8 recollection, other than Danny. Danny --
9 Danny, myself and Mike.
10 WITNESS WALZEL: A Then there was --
11 well, there was another -- Mike Patton, he
12 was there -- he came for -- I don't remember
13 if he was there when you were there.
14 WITNESS KOPECKY: A No. Mike --
15 because they joined me in Azerbaijan. But if
16 you're asking who was there while I was there
17 or while Danny was there, yeah, there was
18 also -- Bud Curtis was later involved in the
19 project.
20 Q Okay. Yeah. And --
21 A Richard Hattenberg.
22 Q I heard Mike Patton, Bud Curtis,
23 Richard Hattenberg -- did I get that right?
24 A Richard Hattenberg.
25 Q Hattenberg. Okay.
26 A John was there at one point while I
27 was there liaising with SoCal engineers in
28 regards to relief wells.

1 Q So the court reporters are happy
2 with me, I'm going to ask you if you can
3 spell their names as best you can.
4 WITNESS WALZEL: A Richard,
5 R-I-C-H-A-R-D H-A-T-T-E-B-E-R-G, Bud Curtis,
6 B-U-D C-U-R-T-I-S.
7 WITNESS KOPECKY: A John.
8 WITNESS WALZEL: A J-O-H-N
9 H-A-T-T-E-N-B-E-R-G, Mike Patton, M-I-K-E
10 P-A-T-T-O-N, Bud Curtis, B-U-D C-U-R-T-I-S,
11 Travis Martel, T-R-A-V-I-S M-A-R-T-E-L.
12 MR. SHER: May we go off the record for
13 one sec?
14 (Off the record.)
15 MR. GRUEN: Let's go back on the
16 record. Thank you.
17 Q A couple other questions. In terms
18 of your -- you had talked about going into
19 the hot zone after a while -- earlier this
20 morning, rather. And just briefly, if you
21 can talk about how do you figure out the
22 limits of the hot zone?
23 WITNESS WALZEL: A Well, like for this
24 well, it was pretty much the whole location,
25 you know. There was one road going up to the
26 pad. So just everything was -- the whole
27 location was considered the hot zone.
28 WITNESS KOPECKY: A I recall, as

1 typical, yeah, it encompassed the entire
2 location, as Danny said. That's due to your
3 lower explosive limit readings out away from
4 the source.
5 Q So --
6 A When they Start to decline, then
7 you get into your warm zone and that type of
8 thing.
9 Q So where the LEL is that a
10 potential for ignition, that's the edge of
11 the hot zone?
12 WITNESS WALZEL: A Yeah. That's one
13 way to define it, or if there's a well on
14 fire, it's -- you can use radiant heat, or
15 there's -- or just whatever factors they want
16 to use to set it up. But in this instance,
17 it was mainly just LELs.
18 Q And Mr. Kopecky, I think you were
19 talking about if the case -- in the case of a
20 well being on fire, how would you define the
21 hot zone? Sounds like you'd do it
22 differently?
23 WITNESS KOPECKY: A Oh, no. That's
24 what Danny was stating. With the radiant
25 heat, that would determine your hot zone to
26 your exclusion zones. But yeah, this was
27 determined by the LEL. But when you
28 mentioned -- I forget how you stated it, you

1 know. The end of the hot zone was at the
2 lower -- I don't remember how you stated it.
3 Q I'll do my best to restate it if I
4 can. What I think I was getting at is if
5 your LEL is just at a point where your LEL --
6 your lower explosive limit could result in
7 ignition, at that point, that would be the
8 edge of your hot zone?
9 WITNESS KOPECKY: A Well, not
10 necessarily. That's the point I wanted to
11 mention is that you would also have a safety
12 factor in that. You would move it out even
13 further.
14 Q I follow you. Okay. And in this
15 case -- so you were beyond the LEL limits --
16 A Correct.
17 Q In establishing your hot zone for
18 SS-25?
19 A Yes, sir.
20 Q I follow. Thank you both. And
21 then in terms of managing the hot zone and
22 who was in it, can you tell us the different
23 personnel that were allowed to enter the hot
24 zone?
25 WITNESS WALZEL: A Depending on the
26 operation going on but -- us, Boots & Coots.
27 The crane operator would be there, his
28 swamper. If we were doing wireline, then,

1 you know -- like when James and I were out
2 there, we would put their equipment on the
3 well, but they might be in their logging unit
4 upwind on location. There was a company that
5 had to pump iron and flow iron. They were,
6 you know -- there was occasions they were in
7 the hot zone.
8 WITNESS KOPECKY: A Also, anyone that
9 did have a legitimate reason to be in the hot
10 zone was always escorted by Boots & Coots and
11 stayed with them the entire time. They were
12 never left in there unattended.
13 Q Did that include SoCalGas
14 personnel?
15 WITNESS KOPECKY: A Correct. It did.
16 Q And I think, Mr. Walzel, you were
17 talking about some of the personnel. Those
18 might have been contractors.
19 WITNESS WALZEL: A Mm-hmm.
20 Q So were there -- can you talk about
21 the SoCalGas personnel -- personnel who were
22 in there with Boots & Coots at times?
23 A Well, I mean, several times they
24 would have a -- safety representatives up
25 there on the edge with our -- Mike Baggett or
26 whoever was our safety man. You know, just
27 various -- management coming in to look, you
28 know, things like that.

1 Q And what role did those individuals
2 have when they were going into the hot zone?
3 WITNESS WALZEL: A Observe. Just take
4 a look. They were safety men. Might do
5 safety things. But if it was SoCal people,
6 it was more or less just always just take a
7 look at what is going on.
8 WITNESS KOPECKY: A Or they may come
9 up with -- there were quite a few regulatory
10 agencies that need to have a visual. They
11 would be escorted in and a lot of times
12 accompanied by, as Danny mentioned, a SoCal
13 representative.
14 Q What were the reasons for Boots &
15 Coots to go into the hot zone?
16 WITNESS WALZEL: A When there was a --
17 for instance, like I mentioned, we wanted to
18 run the noise temp tools, then we would go
19 out to the well and make up the lubricator so
20 they could run their tools in the well. And
21 we did that a lot. You know, when we went in
22 to put cables to secure the wellhead, that
23 was another example. Just whenever there was
24 something necessary to -- run logs, rig up
25 pump iron, remove pump iron, you know, just
26 things like that.
27 WITNESS KOPECKY: A Close and open
28 valves.

1 WITNESS WALZEL: A Close and open
2 valves.
3 Q Thank you. Let me switch gears a
4 little bit to -- I think you had mentioned
5 that Brett Lane was incident commander?
6 A Yes.
7 Q Did I get that right? Okay. So
8 just in terms of communication with the
9 incident commander as you were being made
10 aware of the incident, what was -- can you
11 describe the communications that you had with
12 the incident commander as you were first
13 learning about the incident at SoCalGas at
14 Aliso?
15 WITNESS WALZEL: A I believe -- I
16 mean, we knew about it -- like I was
17 mentioning, he wasn't there the first few
18 days. So we already knew about it by the
19 time he showed up.
20 WITNESS KOPECKY: A I'm not aware who
21 was the incident commander when we arrived.
22 Q Okay.
23 MR. SHER: Q Would you have updated
24 the incident commander on sort of a daily
25 basis as to what was happening?
26 WITNESS WALZEL: A Yes. The
27 communications -- there was always an open
28 line to communication, talk to him in the

1 mornings, and it was an open dialogue, I
2 guess.
3 Q And I imagine once you learned
4 about the incident you were probably thinking
5 about how -- recommending how to fix the
6 incident?
7 A Yes.
8 Q So were you talking with the
9 incident commander about fixes?
10 A Yes.
11 WITNESS KOPECKY: A No, not I. Not
12 myself personally.
13 Q Mr. Walzel, can you tell us more
14 about what you told the incident commander --
15 what you shared with the incident commander?
16 WITNESS WALZEL: A Right. I mean, I
17 don't remember exactly what we talked about,
18 but it would have been, you know, options of,
19 you know, do we do this or -- you know, pump
20 this. You know, it would have been kind of
21 brainstorming different options and then pick
22 an option that -- the best option, you
23 know -- hope for the best results with the
24 least amount of risk as far as, you know,
25 affecting future operations.
26 Q What concerns, if any, did the
27 incident commander identify to you when you
28 were talking through the recommendations and

1 options?
2 A I mean, I don't recall any specific
3 concerns, you know, other than what could
4 happen -- you know, we outlined possibilities
5 but nothing -- no specific conversation comes
6 to mind.
7 Q Okay.
8 MR. SHER: Q Would Mr. Clayton have
9 been the main liaison with Mr. Lane?
10 WITNESS WALZEL: A Yeah. He would
11 have spent -- he was in the trailer with him
12 most of the day.
13 Q So you were literally the boots on
14 the ground doing the work, and some of your
15 other team members may have been more doing,
16 for lack of a better word -- I apologize --
17 but the paperwork?
18 A Well, yes. Initially it was Danny,
19 James, myself, and then Mike Baggett showed
20 up sometime. But yes, initially, if there
21 was equipment to rig up or remove or
22 whatever, it was me and James out there doing
23 that. Then I would go to the trailer
24 different times.
25 Q You mentioned you guys -- Mr.
26 Kopecky, you got a phone call in the evening
27 about 8:00, 8:30.
28 WITNESS KOPECKY: A Yes.

1 Q Then the next morning you flew out.
2 Did SoCalGas provide you with anything to
3 review on the plane on the way out or when
4 you hit the ground at Aliso Canyon, you were
5 given information?
6 A I can't say for sure, but now that
7 you mention it, I'm -- I'm rather confident
8 that there were some documents emailed to me.
9 I feel confident that there were.
10 Q Makes sense to try to get you up to
11 speed as quick as possible?
12 A Right. I'm pretty sure that was
13 the case.
14 MR. SHER: Thank you.
15 MR. GRUEN: Q This is a while back,
16 but do you remember what you were trying to
17 do with the information -- with the documents
18 that you received -- what did -- how did you
19 move forward with that information?
20 A Well, the purpose of it would have
21 been just to familiarize us with the well as
22 much as they possibly could in that amount of
23 time. And I think -- I'm not for sure, but
24 it possibly included the wellbore schematic,
25 which would have been a critical piece of
26 information.
27 Q Yeah. Okay. Did you -- go ahead.
28 I'm sorry.

1 A But you pretty much have to put
2 your eyes on the incident. I mean, you can
3 familiarize yourself with the downhole and
4 that type of thing and you can start bouncing
5 off a plan amongst the team, but that can all
6 change when you get on the ground.
7 Q Yeah. I get you.
8 Mr. Walzel, anything that you
9 recall receiving from the incident commander
10 as you were on your way home?
11 A No. Not specifically, but it would
12 have been, you know, directions to the well,
13 wellbore schematic, just general -- like
14 James, I'd just get kind of an idea --
15 casings might set here or depth here, tubing
16 in the well, tubing not in the well, you
17 know.
18 Q Is there any information that
19 either of you requested when you -- during
20 this time regarding the incident or regarding
21 SS-25?
22 A No, I mean, we -- if you have any
23 well history -- drilling records -- and that
24 would have been to see if there was anything
25 that happened while they drilled the well
26 that might give an idea there might be a
27 problem here. Just -- I mean, it was a long
28 time ago, but we requested just stuff like

1 that. And everything we requested by them, I
2 mean, they provided.
3 Q Okay.
4 WITNESS KOPECKY: A In an initial
5 phone call, anything -- when I mentioned the
6 documents that I think I received, they would
7 have been requested by myself, because I was
8 in communication with the client I think
9 until I received a call 8:00, 8:30 and in
10 communication back and forth until
11 approximately 1:00 a.m. And any information
12 Danny received prior to boarding the plane
13 would have come from myself.]
14 Q Danny Walzel?
15 WITNESS KOPECKY: A Danny Walzel and
16 Danny Clayton.
17 Q Danny Clayton, too.
18 Okay. So you were the sort of
19 point or the liaison to receive the
20 information from SoCalGas on Boots & Coots'
21 behalf as the Boots & Coots team was leaving
22 for Los Angeles?
23 WITNESS KOPECKY: A Correct.
24 WITNESS WALZEL: A He was first on
25 call that night; so he received a call after
26 hours from dispatch.
27 Q I see. Did the point of contact
28 change before you came out?

1 Did someone else serve as the
2 person to receive the information from
3 SoCalGas or did you remain the information
4 point for SoCal.
5 WITNESS KOPECKY: A Oh, no. I was not
6 the information point once we landed. That
7 would go into Danny Clayton.
8 Q Okay. And you were the information
9 point until the Boots & Coots team landed in
10 Los Angeles?
11 WITNESS KOPECKY: A Correct.
12 Q Right. I follow.
13 And then Danny Clayton took over
14 receiving information throughout the
15 incident; is that fair?
16 WITNESS KOPECKY: A During my time
17 there.
18 Q Mr. Walzel, while you were there,
19 since you were there a little bit longer that
20 Mr. Kopecky, did Mr. Clayton remain the
21 information point throughout your time there?
22 WITNESS WALZEL: A Yes.
23 Q Thank you.
24 Let's go off the record for a
25 second.
26 (Off the record.)
27 MR. GRUEN: Back on the record.
28 Go ahead, Mr. Holter.

1 EXAMINATION
2 BY MR. HOLTER:
3 Q Gentlemen, this is for both of you
4 as we visit the subject we talked about.
5 The information we talked about,
6 getting from the Wall files and SoCalGas, and
7 we talked -- Mr. Kopecky, you said dispatch
8 notified you of a call from SoCalGas; is that
9 correct?
10 WITNESS KOPECKY: A Correct. And the
11 way it works, they patch me direct through.
12 Q And that was Todd Van de Putte that
13 you talked to who went directly to you?
14 WITNESS KOPECKY: A If I gave the
15 correct name. Yes.
16 Q Had you worked with him before
17 throughout the years?
18 WITNESS KOPECKY: A No.
19 Q So this is the first time?
20 WITNESS KOPECKY: A (Witness nods
21 head.)
22 Q And you, Mr. Walzel?
23 WITNESS WALZEL: A First time.
24 Q So you requested a set of
25 information that you needed to assess their
26 situation? You discussed it with them; is
27 that my understanding?
28 WITNESS KOPECKY: A I don't know that

1 we were able to discuss it. They were in
2 the -- here, again, I recall they were
3 gathering information on the well for me.
4 Again, it was after hours. So I
5 don't know what they had set up, but they did
6 get -- I say, I think I recall they did send
7 me some information.
8 Q Okay.
9 WITNESS KOPECKY: A That I then
10 distributed.
11 Q Granted, your memory, I'm not going
12 to press you on it. It's not the point.
13 So is it my understanding that once
14 Mr. Clayton came aboard, did he assemble a
15 team then within a matter of hours so to
16 speak? Is that how it works?
17 WITNESS WALZEL: A Well, James,
18 myself, and Dan Clayton flew out together; so
19 that was our Boots & Coots team.
20 Q You explained you were in the hot
21 zone or managing that. Are you driving --
22 what you're discovering -- now, we're moving
23 to on the site, once you're out there.
24 Are you driving what information
25 you have, including what you've read in the
26 well files from SoCalGas and feeding that
27 information to Mr. Clayton?
28 WITNESS KOPECKY: A Well, I wasn't --

1 other than, I mean, I didn't really have a
2 real purpose to review the well bore
3 schematic. Danny and Danny Clayton would
4 have been looking at that, Danny in
5 particular, to figure -- to do his
6 calculations and all, but I guess, the second
7 part of your question, were we relaying
8 information. Any time -- since we were at
9 the well itself, any time there was any
10 change in anything, we would report it down
11 to Danny that would then convey that to Lane,
12 Bret Lane.
13 Q Appreciate that.
14 WITNESS KOPECKY: A Bret Lane.
15 Q Right. Bret Lane.
16 And when you refer to "Danny" doing
17 calculations, can you clarify which Danny you
18 are talking about.
19 WITNESS KOPECKY: A Danny Walzel.
20 Q So, Mr. Walzel, are you -- is that
21 your role in this particular instance on
22 SS-25 well to provide calculations based on
23 information you gathered and provide that to
24 Mr. Clayton?
25 WITNESS WALZEL: A Well, like I
26 mentioned, but probably 90 percent of what,
27 you know, James and myself did the same
28 thing, hammer up iron, rig up, you know, if

1 there was -- Boots & Coots needed to write
2 something or present something, then, yeah,
3 then I would do the paperwork part of it. So
4 90 percent of what we did was the same.
5 WITNESS KOPECKY: A Right.
6 WITNESS WALZEL: A But, yeah, if we
7 need to do a calculation or write a
8 procedure, then I was one that did that.
9 Q Is that the structure that held
10 until you both left that incident?
11 WITNESS WALZEL: A Yes.
12 WITNESS KOPECKY: A Yes.
13 Q And then are you aware of what
14 Mr. Clayton did with that information after
15 you gave it to him?
16 WITNESS WALZEL: A Gave to what -- I
17 mean, discussed with SoCal.
18 WITNESS KOPECKY: A With SoCal.
19 Q Was there anybody from SoCal
20 providing the same comparative calcs or
21 working with you during this time,
22 Mr. Walzel?
23 WITNESS WALZEL: A Yes. I mean, there
24 wasn't someone working by my side the whole
25 time, but their engineers were doing, you
26 know, mainly relief well stuff and, you know,
27 getting a plan for that, and, you know, doing
28 engineering stuff in the office.

Q I'm actually trying to understand, again, on the same note, clarity, about who is -- if they're looking to you within your team --

WITNESS WALZEL: A Right.

Q -- and then SoCalGas supervising the calculations and which way the information is flowing, if it goes back and forth.

WITNESS WALZEL: A Yeah. It was back and forth. Like I said, it was real open. Anybody could go to anybody and talk or ask a question.

Q So on the SoCal team, can you provide some names of who was providing either engineering calculations or who the engineers you were, so to speak, bouncing off your approach with or position.

WITNESS WALZEL: A I don't remember their names.

Q But there was somebody from SoCalGas?

A Yes.

Q Was it Mr. Van de Putte?

WITNESS WALZEL: A No. He was -- my understanding was he was the consultant company man, and I think he stayed -- he was there for the first --

1 WITNESS KOPECKY: A Few days.
2 WITNESS WALZEL: A He was there for
3 the first time because I know he was there
4 when the coral tubing was doing ice plug --
5 (Clarification by reporter.)
6 WITNESS WALZEL: A At least for the
7 first kill attempt. I remember him being
8 there while we went and washed out the ice
9 plug, but, no, he was the company man, and
10 then I don't know their names, but there was
11 two or three engineers.
12 Q So would it be Mr. Lane that you
13 specifically your team's working with,
14 meaning the four of you, Mr. Baggett, two
15 Danny's --
16 WITNESS KOPECKY: A We worked a lot
17 with a gentleman by the name of Mike Dosier
18 as well, but that was -- that was -- I want
19 to say logistics.
20 WITNESS WALZEL: A Yeah. Logistics.
21 WITNESS KOPECKY: A We were sourcing
22 equipment, and he was our go-to to make that
23 happen.
24 Q So I hear you that names don't come
25 to mind, but, generally, during your time
26 there, you were considered providing -- from
27 what information you received from the site
28 and files you were providing calculations to

1 make attempts to kill. That was your role?
2 WITNESS WALZEL: A Right. It wasn't
3 like every day all day long we're just --
4 (indicating).
5 Q I understand.
6 WITNESS WALZEL: A 90 percent of it
7 was the manual labor in the hot zone, getting
8 ready for the next bump shot and stuff like
9 that.
10 Q Understood. Results came out of
11 first and second kill attempts. Is it my
12 understanding that your -- you did not make
13 any adjustments in, say, the calculations
14 other than mud weights, and whatever, but as
15 far as methodology it was the same procedure
16 throughout as when you left.
17 WITNESS WALZEL: A From the best I can
18 recall, the only -- one time we might not
19 have pumped Barite, and another time we might
20 have pumped -- changed the amount of Barite.
21 At the end, we pumped a Barite pill with the
22 idea of the Barite falling out and plugging
23 up -- plugging the bottom of the well.
24 We might have changed the volumes,
25 but, again, the pump -- we could only pump so
26 fast, and so there wasn't -- other than what
27 we pumped there wasn't a whole lot to change
28 in between each one.

1 Q And then you were talking about you
2 assessed there was a leak at some time?
3 WITNESS WALZEL: A Yeah.
4 Q Either immediately or -- was that
5 specifically to that well or did you --
6 there's two other wells near it. Did you
7 guys --
8 WITNESS WALZEL: A Correct.
9 Q -- look at those other two wells
10 and put them into your mix --
11 WITNESS KOPECKY: A As I recall, we
12 checked pressures on them.
13 WITNESS WALZEL: A We checked
14 pressures daily. Or you know, we put gauges
15 on all the -- on the wellhead, all the
16 different --
17 WITNESS KOPECKY: A Casing strings.
18 WITNESS WALZEL: A -- casing strings,
19 and I don't recall if we ran logs on one of
20 them.
21 WITNESS KOPECKY: A I'm pretty sure we
22 did, and we also attempted to monitor, I
23 believe, those gauges while we were
24 performing the kill to make sure there was no
25 communication.
26 WITNESS WALZEL: A Right because those
27 were the gauges that we could get on the
28 phone.

1 WITNESS KOPECKY: A Yeah.
2 WITNESS WALZEL: A They were being
3 continuously monitored 24 hours a day.
4 Q So SS-25 did not have that ability
5 because of the gas flow coming out of it?
6 In other words, you're talking
7 SS-25 was a dynamic kill attempt; right?
8 WITNESS WALZEL: A Yeah.
9 Q So can you restate whether you were
10 or weren't able to get a flow rate at any
11 time on SS-25?
12 WITNESS WALZEL: A No there was no
13 time we ever got an actual flow rate coming
14 from the well.
15 Q Okay. So your attempts were your
16 best professional understanding based on the
17 conditions of an unknown flow rate?
18 WITNESS WALZEL: A Correct.
19 WITNESS KOPECKY: A Correct.
20 Q And the gas company, SoCalGas, at
21 any time did they give you any numbers of
22 estimates of what they thought you should use
23 for that?
24 WITNESS KOPECKY: A Not to my
25 knowledge. You mean for the actual --
26 Q Yes.
27 WITNESS WALZEL: A No. There was
28 numbers given -- again, you know, an absolute

1 open flow numbers that were calculated. No,
2 if the well had got knocked off and it was
3 coming --
4 Q Is that like what would be called a
5 worst case calculation?
6 WITNESS WALZEL: A Worst case.
7 Q And you put your greatest
8 overburden pressure on that as your putting
9 calculations together?
10 WITNESS WALZEL: A I'm not following
11 the "overburden."
12 Q Like you -- for your head.
13 WITNESS WALZEL: A I understand.
14 Q There you go.
15 WITNESS WALZEL: A Again, it's a rate.
16 So now you got, you know, velocities and all
17 this other stuff. It's not just like normal
18 drilling where you're just choking out a
19 well; you just pump it real slow.
20 But, yes, there was numbers given,
21 you know, so what this well actually was, no
22 one really knows because it was coming out in
23 the ground. You know, there was no way to
24 capture it or still looking for all the
25 unknowns to figure out, but, you know, it
26 would have been a ball -- you know, it would
27 have been hard to get an exact number of what
28 it was.

1 Q Understood. And this continued at
2 least for the first two attempts, and then
3 was there a point which a consultant was
4 brought in to work with you?
5 Did you work with Mr. Shackleford
6 at all?
7 WITNESS KOPECKY: A I was aware that
8 he was involved, but I was long gone from the
9 operation.
10 WITNESS WALZEL: A Yes. He came after
11 I left, but it was more for the relief well.
12 Q So he didn't provide anything for
13 the top kill attempts?
14 WITNESS WALZEL: A No.
15 Q Okay. Thank you.
16 And so at what point, after you
17 assessed the leak was in SS-25, did you make
18 an assessment or could you?
19 You talked about performing a jump
20 shot. At what point did you make assessment
21 like where that was in pipe depth?
22 WITNESS WALZEL: A the only -- yeah,
23 there was no way to tell from pumping that
24 and how fast it come out because I think it
25 was like within the first five barrels, the
26 stuff was already coming out, but the only
27 thing, you know, when we ran the temperature
28 log, you know, there was -- it was cold, say,

1 800 to 1,000 feet.
2 Again, those aren't exact numbers,
3 but there was a range somewhere in there. So
4 and the tools were messing up in those
5 depths, somewhere in there. So we knew the
6 hole was probably somewhere around there.
7 Q Okay. And walk us through your
8 assessment to make a change or not a change.
9 You did generally talk about that, but maybe
10 a little more just detail about the
11 conversations you had with SoCalGas internal
12 as a team to what your approach would be
13 right there to make more kill attempts.
14 WITNESS WALZEL: A Right. So if the
15 hole was, say, at 800 foot. You're only
16 losing 800 foot a well so that's not -- you
17 know, as far as mud weight goes, that's
18 probably not a whole lot, you know, change in
19 pressure, you know, for 800 foot of 10-pound
20 mud or whatever.
21 So we were already -- from what I
22 recall, we were already overbalanced. You
23 know, the mud was sufficient. So it wouldn't
24 have really changed a bunch in the next step.
25 Q Was there any point which you
26 looked at the well and the crater and the
27 fluids coming out and assessed there may be
28 some critical point which the well would

1 reach a state where you literally could not
2 even get there and understanding the top was
3 probably about the relief well, but is there
4 a point which you discussed this is a safety
5 threshold we've seen in our experience.
6 SoCalGas is concerned.
7 Did you have discussion about that,
8 to go forward or not go forward?
9 WITNESS WALZEL: A I don't recall the
10 exact conversations, but, you know, that was
11 discussed, that -- we do we try again, and it
12 really came down to, you know, if the crater
13 got big enough and the mountain top was lost,
14 and we wouldn't have been able to get to the
15 well to do anything with because even during
16 relief-well operations you want to still
17 monitor blowout well if you can and have
18 access to it. So didn't want to disturb the
19 crater anymore.
20 Q Were you there when they put the
21 bridge over?
22 WITNESS WALZEL: A No. It was being
23 built when --
24 MR. HOLTER: So it was after you guys.
25 WITNESS WALZEL: A Right.
26 MR. HOLTER: That's it. No further
27 questions. Appreciate it. Thank you.
28 MR. GRUEN: Anyone else?

1 MS. ROSE: Can I ask a question?
2 MR. GRUEN: Yes.
3 MS. ROSE: Q Going back to when you
4 first heard about the incident on the phone
5 and then you flew over at that time and you
6 first arrived and you got that packet of
7 information, like the well-bore history, all
8 that stuff.
9 Did you receive information about
10 any other well-control efforts or well
11 intervention that had been done on SS-25
12 prior?
13 WITNESS KOPECKY: A Not to my
14 knowledge. I don't recall.
15 WITNESS WALZEL: A I don't recall
16 either.
17 MS. ROSE: Thank you.
18 MR. GRUEN: Q I have just one other
19 question. After the first well-kill attempt
20 did not work for the first Boots & Coots one,
21 what chances did you think there were of
22 succeeding the next time on the next
23 well-kill attempt?
24 Did you look at that?
25 WITNESS WALZEL: A I mean, we didn't
26 put any probability numbers to it.
27 Q Okay.
28 WITNESS KOPECKY: A I don't know. To

1 clarify, I felt confident every time we
2 pumped that we were going to kill the well.
3 WITNESS WALZEL: A Yeah.
4 WITNESS KOPECKY: A Unfortunately, we
5 weren't successful with the surface kill.
6 Q That's fair. I appreciate that.
7 WITNESS WALZEL: A I know that from
8 the first or second, it laid down and was
9 pretty -- didn't do anything for a little
10 bit, but, you know, for whatever reason
11 fluids went into the reservoir, you know, it
12 came back, you know.
13 WITNESS KOPECKY: A Could not maintain
14 the hydrostatic head.
15 MR. GRUEN: Unless anybody else has any
16 questions, we're going to thank you for your
17 time. We appreciate you being here, as well
18 as both counsel. Thank you. And that's all
19 we have for today. Let's go off the record.
20 (Whereupon, at the hour of 3:10
21 p.m., the examination under oath then adjourned.)
22 * * * * *
23]
24
25
26
27
28

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Doris Huaman, Certified Shorthand Reporter No. 10358, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on August 8, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 8th day of August, 2018.

Doris Huaman

Doris Huaman
CSR No. 10538

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Andrea L. Ross, Certified Shorthand Reporter No. 7896, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on August 8, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 8th day of August, 2018.

Andrea L. Ross
CSR No. 7896

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Shannon Ross, Certified Shorthand Reporter No. 8916, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on August 8, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 8th day of August, 2018.

SHANNON ROSS
CSR No. 8916

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-57 DATED MARCH 26, 2020)

SOCALGAS RESPONSE DATED MAY 7, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated March 26, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

For this data request, please refer to the SoCalGas reply testimony, Chapter IV, "Prepared Reply Testimony of Danny Walzel and Dr. Arash Haghshenas on Behalf of Southern California Gas Company".

a. Please articulate the exact role that Danny Walzel assumed to kill well SS-25.

b. Please provide all invoices and other documents from Boots & Coots to SoCalGas for work done during the time of the well SS-25 leak that show the role Mr. Walzel assumed in killing well SS-25
c. Please articulate the exact role that Dr. Hagshenas assumed to kill well SS-25.
d. Please provide all invoices and other documents from Boots & Coots to SoCalGas for work done during the time of the well SS-25 leak that show the role Dr. Haghshenas assumed in killing well SS-25

RESPONSE 1:

a. SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the terms "role" and "assumed," and seeks information that is already within SED's possession or equally available to SED (see transcript of SED's examination under oath of Mr. Walzel, attached to SED's Opening Testimony). Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Mr. Walzel contributed to Boots & Coots' well control efforts beginning on October 25, 2015, and until he departed from Aliso Canyon on December 14, 2015. During this period Mr. Walzel held the position of Senior Well Control Engineer. Mr. Walzel was responsible for rigging-up equipment, preparing modeling in connection with the kill attempts, and preparing and physically implementing the pumping operations during kill attempt numbers 2–6. SoCalGas notes that Mr. Walzel was made available to SED on August 8, 2018 for an Examination Under Oath (EUO) at the California Public Utilities Commission's San Francisco Office. Further information regarding Mr. Walzel's role was provided to SED's five questioners during that EUO.

b. SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent it seeks invoices "that show the role Mr. Walzel assumed in killing well SS-25" "during the time of the well SS-25 leak." SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent it seeks "all invoices and other documents." SoCalGas further objects to this request to the extent it seeks documents already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas assumes

this question seeks the Boots & Coots Daily Reports that SoCalGas previously provided to SED. Please see electronic documents previously produced to SED (AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808).

c. SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the terms "role" and "assumed." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Dr. Haghshenas was involved in the SS-25 well control efforts beginning December 2, 2015[1] and ending February 18, 2016. During this period Dr. Haghshenas conducted transient modeling for the 7th top kill attempt. Dr. Haghshenas also prepared a model and ran simulations for the relief well used to control SS-25.

d. SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent it seeks invoices "that show the role Dr. Haghshenas assumed in killing well SS-25" "during the time of the well SS-25 leak." SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent it seeks "all invoices and other documents." SoCalGas further objects to this request to the extent it seeks documents already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this question to seek the Boots & Coots Daily Reports. Please see documents previously produced to SED (AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808).

QUESTION 2:

Please refer to the following passages in the Chapter IV reply testimony, page 3 to answer rest of the questions in this data request, except for questions 32 and 33.

> Q: DID BOOTS & COOTS PERFORM TRANSIENT KILL MODELING PRIOR TO KILL ATTEMPT #7?

[1] SoCalGas notes that a typographical error appears in SoCalGas' Reply, Chapter IV (Walzel/Haghshenas) at page 2, line 3. The date "December 7" should be replaced with "December 2," as stated in this response.

> A: Yes. Boots & Coots performed transient kill modeling before kill attempt number seven. After Boots & Coots attempted its second well kill attempt on November 15, 2015, and before its well kill attempt on November 18 2015, and for additional kill attempts thereafter, Boots & Coots performed transient modeling.
>
> Q: DOES BOOTS & COOTS HAVE THE TRANSIENT MODELING RECORDS RELATED TO ITS SS-25 KILL ATTEMPTS?
>
> A: Only for the December 22, 2015, well kill. Danny Walzel had conducted the transient modeling for well kill prior to December 22, 2015. However, the transient modeling was done on his laptop. This laptop was stolen from him, along with other personal items, in late December 2015. Mr. Walzel reported the theft to the police. Mr. Walzel's transient modeling was not saved anywhere else, nor was it sent to anyone else.

With these passages in mind, please answer the following questions.

RESPONSE 2:

SoCalGas objects to this request to the extent it asks no question to which SoCalGas can respond.

QUESTION 3:

Provide the police report of the theft that Mr. Walzel reported to the police.

RESPONSE 3:

SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the term "police report." SoCalGas further objects to this request it seeks documents not in SoCalGas' possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. The Houston Police Department provided Mr. Walzel with a document regarding the reported theft of Mr. Walzel's laptop and other belongings, provided here bearing the following bates number: AC_CPUC_SED_DR_57_0000001.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-57 DATED MARCH 26, 2020)

SOCALGAS RESPONSE DATED MAY 7, 2020

QUESTION 4:

Did SoCalGas disclose the information in these passages to Blade Energy Partners (Blade) during Blade's Root Cause Analysis?

RESPONSE 4:

SoCalGas objects to this request to the extent it is vague and ambiguous regarding the terms "the information in these passages." SoCalGas further objects to this request to the extent it assumes Blade specifically asked SoCalGas to produce "transient modeling" in connection with the SS-25 well control efforts. SoCalGas further objects to this request to the extent it seeks information that is equally available to SED, as SED was copied on all data request responses provided to Blade Energy Partners in the course of Blade's investigation prior to issuing its Root Cause Analysis report. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Regarding the details described in the testimony excerpted by SED in the passage above, SoCalGas first became aware of this information cited in the excerpted passage on February 21, 2020, after Blade Energy Partners had issued its Root Cause Analysis Report.

QUESTION 5:

If the answer to question 4 is yes, provide documentation showing this, including the dates and the Blade data requests to which this information responded.

RESPONSE 5:

N/A. See response to Question 4.

QUESTION 6:

If the answer to question 4 is no, please explain why not.

RESPONSE 6:

See response to Question 4.

QUESTION 7:

When did SoCalGas first learn of the information provided in these passages?

RESPONSE 7:

SoCalGas objects to this request to the extent it is vague and ambiguous due to the compound nature of the question. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Question 4.

QUESTION 8:

Provide documentation showing the answer to question 7.

RESPONSE 8:

SoCalGas objects to this question to the extent it is vague and ambiguous and unintelligible to the extent it seeks documentation that SoCalGas was not aware of a fact. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

Please see SoCalGas Reply Testimony, Ex. III-4 (Danny Walzel Depo. (Feb. 21, 2020).)

QUESTION 9:

Beginning October 23, 2015 and continuing until well SS-25 was successfully killed, did SoCalGas have any procedures, plans, protocols, or other requirements in place that it be provided with records related to a well kill such as the well kills for SS-25, including transient modeling records?

RESPONSE 9:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrases "such as the well kills for SS-25," and "transient modeling records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No.

QUESTION 10:

If the answer to question 9 is yes, please provide all such requirements, and identify the page number and quoted excerpt or excerpts that support the answer.

RESPONSE 10:

N/A. Please see response to Question 9.

QUESTION 11:

Given that SoCalGas must comply with the safety requirements of California Public Utilities Code Section 451, please answer the following:

a. Does SoCalGas find it acceptable the assertion in Mr. Walzel's testimony that "Mr. Walzel's transient modeling was not saved anywhere else, nor was it sent to anyone else"?
b. Does SoCalGas take the position that it was appropriate for transient modeling of the SS-25 well kill attempts to not have been saved anywhere else than Mr. Walzel's laptop, and not to have been sent to anyone else?

RESPONSE 11:

a. SoCalGas objects to this question on the grounds it is vague, ambiguous and unintelligible with respect to the phrase "find it acceptable the assertion" and relation to Section 451 of the California Public Utilities Code. SoCalGas further objects to this request to the extent it calls for a legal conclusion. SoCalGas additionally objects to this request to the extent it constitutes an incomplete hypothetical.

b. SoCalGas objects to this question on the grounds it is vague and ambiguous with respect to the term "appropriate" and relation to Section 451 of the California Public Utilities Code. SoCalGas further objects to this request to the extent it calls for a legal conclusion. SoCalGas further objects to this request to the extent that it assumes that regulations and/or industry standards require that well control efforts necessarily require transient modeling.

QUESTION 12:

How many transient models were created for the kill attempts of SS-25?

RESPONSE 12:

SoCalGas objects to this question on the grounds it is vague, ambiguous and unintelligible with respect to the phrase "[h]ow many transient models." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this question to ask for the number of discrete models that were created in connection with the seven top kills attempted on SS-25. SoCalGas understands from Boots & Coots that Boots & Coots used software to prepare one discrete transient model in connection with top kill attempts 3-6, and a second discrete model for top kill attempt 7.

QUESTION 13:

Please list the number of transient models that were created for each well kill attempt of SS-25. Please be sure to include the date each model was completed, and the kill attempt for which each model was used.

RESPONSE 13:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrase "number of transient models." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

As described in SoCalGas' Reply Testimony, Boots & Coots performed transient kill modeling before its November 18, 2015 kill attempt and for each kill attempt thereafter.

However, the laptop containing the modeling for kill attempts 3-6 was stolen from Mr. Walzel's vehicle after he returned to Houston, and the laptop was never recovered. (*See*, SoCalGas' Reply Testimony Chapter IV (Walzel/Haghshenas) at 3.) Therefore, SoCalGas cannot provide the detail sought for the modeling that was conducted in support of top kill attempts 3-6. Transient modeling prepared in connection with the 7th kill attempt was prepared on or around December 16, 2015 and completed prior to the 7th kill attempt on December 22, 2015.

QUESTION 14:

Other than Mr. Walzel, did any other Boots & Coots employee, SoCalGas personnel member, or any other individual develop or produce, or help develop or help produce a transient model that was used to kill SS-25?

RESPONSE 14:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrases "develop or produce" and "help develop and produce." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this request to seek information regarding the transient modeling prepared in connection with top kill attempts 3-7. Yes, another Boots & Coots employee prepared modeling in connection with the 7th top kill attempted on SS-25.

QUESTION 15:

If so, please identify each individual, the model they developed or produced, or helped develop or produce, the date the model was produced, and the kill for which the model was produced.

RESPONSE 15

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrases "develop or produce" and "help develop and produce." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

SoCalGas understands this request to seek information regarding the transient modeling prepared in connection with top kill attempts 3-7. In December 2015, Dr. Haghshenas of Boots & Coots helped develop a transient model in connection with the 7th top kill attempted on SS-25.

QUESTION 16:

Please provide each model identified in response to the prior question.

RESPONSE 16:

SoCalGas objects to this request to the extent it seeks information that is not in the custody or control of SoCalGas or Boots & Coots. SoCalGas further objects to this request as vague and ambiguous regarding the term "model." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. As noted in SoCalGas' Reply Testimony Chapter IV (Walzel / Haghshenas), and acknowledged by SED in Question 2 of this data request, only the transient kill modeling prepared in connection with the December 22, 2015 top kill attempt is within the possession, custody, or control of Boots & Coots. Therefore, SoCalGas interprets this request as seeking the transient model prepared in connection with Boots & Coots' seventh well kill attempt. However, the "model" itself cannot be reviewed without access to licensed modeling software. To the extent that SED seeks transient modeling data related to the seventh kill attempt, please see documents previously provided to SED: AC_CPUC_0173909 – AC_CPUC_0173913; AC_CPUC_0173168 – AC_CPUC_0173172.

QUESTION 17:

Did Mr. Walzel participate in all of the Boots & Coots well kill attempts?

RESPONSE 17:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "participate." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

No. As described in SoCalGas' Reply Testimony, Mr. Walzel contributed to Boots & Coots' well control efforts beginning on October 25, 2015 and until he departed from Aliso Canyon on December 14, 2015.

QUESTION 18:

Did Mr. Walzel take any notes related to the transient models that were not on his stolen laptop?

RESPONSE 18:

SoCalGas objects to this request as vague and ambiguous regarding the term "notes related to the transient models." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets "notes" as notes taken by Mr. Walzel and not correspondence. No. SoCalGas understands from Boots & Coots that all notes, if any, taken by Mr. Walzel would have been transcribed on his laptop that was later stolen from Mr. Walzel's vehicle.

QUESTION 19:

If so, please provide all such notes.

RESPONSE 19:

N/A. See response to Question 18.

QUESTION 20:

Please confirm that all transient models were actually SAVED on Mr. Walzel's stolen laptop.

RESPONSE 20:

SoCalGas objects to this question on the basis that it is vague and ambiguous and unintelligible with respect to the capitalization of the word SAVED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

SoCalGas understands from Boots & Coots that transient modeling prepared in support of well kill attempts 3-6 were saved on the laptop that was stolen from Mr. Walzel's vehicle.

QUESTION 21:

Did SoCalGas authorize the use of Mr. Walzel's transient models for each of the well kill attempts?

RESPONSE 21:

SoCalGas objects to this question on the basis that it is vague and ambiguous and unintelligible with respect to the phrase "authorize the use of." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

The transient modeling helped inform the kill plans prepared by Boots & Coots. SoCalGas approved the kill plans that were prepared by Boots & Coots and ultimately used to implement each top kill attempt.

QUESTION 22:

Was a different transient model created for each well kill attempt?

RESPONSE 22:

SoCalGas objects to this request to the extent it is duplicative of Questions 12 and 13. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Questions 12 and 13.

QUESTION 23:

If so, please identify each well kill attempt for which a transient model was used.

RESPONSE 23:

SoCalGas objects to this question to the extent it seeks information that is already in the possession of SED. SoCalGas further objects to this request to the extent it is duplicative of Questions 12 and 13. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See responses to Questions 12 and 13 herein. As stated in SoCalGas' Reply Testimony Chapter IV (Walzel / Haghshenas), transient modeling was performed for each well kill performed by Boots & Coots after Boots & Coots' second attempt.

QUESTION 24:

If not, why not?

RESPONSE 24:

SoCalGas objects to this question to the extent it is vague, ambiguous, and unintelligible to the extent it purports to ask a question without a premise. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.
See responses to Questions 22 and 23.

QUESTION 25:

Did SoCalGas review Mr. Walzel's transient models?

RESPONSE 25:

SoCalGas reviewed and approved the kill plans that were prepared by Boots & Coots and ultimately used to implement each top kill attempt. The transient modeling helped inform the kill plans prepared by Boots & Coots.

QUESTION 26:

Did SoCalGas approve each of Mr. Walzel's transient models before the well kill attempt for which they were used?

RESPONSE 26:

SoCalGas objects to this question to the extent it is vague and ambiguous, particularly in reference to Question 21 of this data request, which asks whether SoCalGas "authorize[d]" the use of Mr. Walzel's transient models. SoCalGas further objects to this request to the extent it is duplicative of Question 21 herein. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this question to ask the same question posed in Question 21 herein. Accordingly, see SoCalGas' response to Question 21.

QUESTION 27:

If not, why not?

RESPONSE 27:

SoCalGas objects to this question to the extent it is vague, ambiguous, and unintelligible to the extent it purports to ask a question without a premise. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See responses to Questions 21, 25 and 26.

QUESTION 28:

If SoCalGas approved of each of Mr. Walzel's transient models before the well kill attempt for which they were used, describe SoCalGas's review process of Mr. Walzel's transient models?

RESPONSE 28:

SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "review process." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See responses to Questions 21, 25, and 26.

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QUESTION 29:

If SoCalGas approved of each of Mr. Walzel's transient models before the well kill attempt for which they were used, please identify the individual from SoCalGas who approved of Mr. Walzel's transient models?

RESPONSE 29:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the use of the term "approved of." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A. See responses to Questions 21, 25 and 26.

QUESTIONS 30:

Please define in detail the process behind creating a transient well model.

a. For example, what are the inputs?
b. What are the outputs?
c. Etc.

RESPONSE 30:

SoCalGas objects to this question on the grounds it is vague and ambiguous with respect to the request to "define" a "process," and unintelligible at subpart (c) of the question. SoCalGas further objects to this request to the extent that it seeks information that is equally available to SED and does not require discovery from SoCalGas nor its testifying witnesses.

QUESTION 31:

Consistent with industry practice, please state all steps and calculations necessary to produce a transient well model.

RESPONSE 31:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrase, "Consistent with industry practice" – this phrase renders the question posed unintelligible. SoCalGas further objects to this request to the extent that it seeks information that is equally available to SED and does not require discovery from SoCalGas nor its testifying witnesses.

QUESTION 32:

Please state all steps and calculations that were taken to produce the transient well models that Mr. Walzel's testimony asserts that were done for the well SS-25 kill attempts.

RESPONSE 32:

SoCalGas objects to this question on the grounds it is vague and ambiguous and unintelligible with respect to the phrase "the transient well models that Mr. Walzel's testimony asserts that were done for the well SS-25 kill." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Based on conversations with Boots & Coots, SoCalGas understands that Mr. Walzel prepared modeling for kill attempts 3-6 using Drillbench. The preparation of the model included the following general steps: (1) define the wellbore parameters, including the trajectory, casing, drill pipe and tubing; (2) define the kill fluid properties; (3) define reservoir properties, such as the reservoir fluid, and the reservoir capabilities for the blowout condition; (4) define the flow path, and surface condition; and (5) define the temperature profile in the wellbore.

QUESTION 33:

Did SoCalGas or any entity that it hired conduct transient modeling related to its SS-25 kill attempts after December 22, 2015?

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RESPONSE 33:

SoCalGas objects to this question on the basis that it is vague and ambiguous with respect to the phrase "transient modeling related to its SS-25 kill attempts." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request as seeking whether SoCalGas or any entity that it hired conducted transient modeling to assist with SS-25 top kill attempts after December 22, 2015. No, the final top kill attempt was executed on December 22, 2015.

QUESTION 34:

If the answer to question 33 is yes, please provide the transient modeling records showing the answer.

RESPONSE 34:

N/A. See response to Question 33.

QUESTION 35:

If the answer to question 33 is yes, please explain why such models were conducted.

RESPONSE 35:

N/A. See response to Question 33.

QUESTION 36:

If the answer to question 33 is no, why not?

RESPONSE 36:

N/A. See response to Question 33.

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QUESTION 37:

Were any other records related to SoCalGas's SS-25 kill attempts on Mr. Walzel's stolen laptop?

RESPONSE 37:

SoCalGas objects to the question to the extent it is vague and ambiguous with respect to the phrase "any other records" – the predicate has not been established. SoCalGas further objects to this request to the extent that it seeks information that is not in the possession, custody or control of Boots & Coots, or SoCalGas. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

SoCalGas interprets this question to ask whether Mr. Walzel retained information other than the transient kill models referenced in SoCalGas' Reply Testimony, Chapter IV (Walzel / Haghshenas) on page 3, on his laptop. Mr. Walzel's laptop was stolen over four years ago, and has not since been recovered. SoCalGas has inquired with Boots & Coots, and without having access to Mr. Walzel's stolen laptop, neither Boots & Coots nor SoCalGas is able to respond to this request.

QUESTION 38:

If the answer to question 37 is yes, please list them.

RESPONSE 38:

SoCalGas objects to this request on the ground it is overly broad and unduly burdensome. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Mr. Walzel's laptop was stolen over four years ago, and has not since been recovered. SoCalGas has inquired with Boots & Coots, and without having access to Mr. Walzel's stolen laptop, neither Boots & Coots nor SoCalGas is able to respond to this request.

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QUESTION 39:

For each of the records listed in response to question 37, please state whether the record was saved elsewhere (e..g, a main server, on portable drive, etc.), or sent to another person. For each record that was saved elsewhere or sent to another person, please identify where the record was saved and to whom the record was sent.

RESPONSE 39:

SoCalGas objects to this request on the grounds the question is overly broad and unduly burdensome. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

N/A. See response to Question 38.

QUESTION 40:

Please describe the purpose of each record listed in response to question 37.

RESPONSE 40:

N/A. See response to Question 38.

QUESTION 41:

Was Mr. Walzel's stolen laptop recovered?

RESPONSE 41:

No. See responses to Questions 13 and 37.

QUESTION 42:

If the answer to question 41 is yes, were any of the transient models on it?

RESPONSE 42:

N/A. See response to Question 41.

QUESTION 43:

If the answer to question 41 is yes, were any other records related to SoCalGas's SS-25 kill attempts on it?

RESPONSE 43:

N/A. See response to Question 41.

QUESTION 44:

From what exact location was Mr. Walzel's laptop stolen?

RESPONSE 44:

7138 Farm to Market 1960 Rd. W, Houston Texas, 77070.

QUESTION 45:

When it was stolen, was Mr. Walzel's laptop inside a secure space that was somehow protected against property inside of it being stolen?

RESPONSE 45:

SoCalGas objects to this request on the ground it is vague and ambiguous with respect to the phrases "secure space" and "somehow protected against property inside of it being stolen." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Mr. Walzel's laptop was locked inside of his truck.

QUESTION 46:

If the answer to question 45 is yes, please describe the secure space, and all protections that the space had in place to protect against stolen property.

RESPONSE 46:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see Response to Question 45.

QUESTION 47:

If Mr. Walzel's laptop was not inside a secure space when stolen, why not?

RESPONSE 47:

N/A. See responses to Questions 45 and 46.

QUESTION 48:

For prior SoCalGas well kill attempts (both for SS-25 and others), have any transient modeling records been stolen from SoCalGas or its employees or contractors?

RESPONSE 48:

SoCalGas objects to the question to the extent it is vague and ambiguous with respect to the phrase "transient modeling records." SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

Aside from the transient modeling that was contained on Mr. Walzel's stolen laptop, SoCalGas is not aware of any other property theft in connection with the SS-25 incident.

QUESTION 49:

If so, please list them.

RESPONSE 49:

SoCalGas objects to this question on the grounds it is vague and ambiguous to the extent it poses a request without any reference. Subject to and without waiving the foregoing objection, SoCalGas responds as follows: N/A. Please see response to Question 48.

QUESTION 50:

For prior well kill attempts, has SoCalGas ever allowed its contractor to keep transient modeling records, but not save the records anywhere other than their laptop, and not send the records to anyone else?

RESPONSE 50:

SoCalGas objects to this request on the grounds it is vague and ambiguous with respect to the phrase "transient modeling records," and compound, argumentative, and overly broad and unduly burdensome to the extent it is not limited to any time frame to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

The use of transient modeling is not a widely utilized practice in the industry for controlling well failures by top kill. Aside from the SS-25 incident, SoCalGas has never worked with a contractor that prepared transient kill modeling for a well control operation at Aliso Canyon.

QUESTION 51:

If so, please list all such instances.

RESPONSE 51:

SoCalGas objects to this question to the extent it makes a request without any reference. Subject to and without waiving the foregoing objection, SoCalGas responds as follows: N/A. Please see response to Question 50.

QUESTION 52:

With regards to the well kill attempts of SS-25, did Boot & Coots use transient modeling for any earlier attempt to inform the decision making related to any later attempt?

RESPONSE 52:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the terms "earlier attempt" and "later attempt" and the phrase "inform the decision making related to." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.

QUESTION 53:

What else was with Mr. Walzel's laptop at the time it was stolen? Please be specific in answering this question. For example, if other equipment, notes, or other things were stolen, please describe them in detail.

RESPONSE 53:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this

proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas additionally objects to this question to the extent it is compound, unintelligible, and internally inconsistent to the extent it asks SoCalGas to identify what items were "with Mr. Walzel's laptop at the time it was stolen," but later asks SoCalGas to identify items that "were stolen."

QUESTION 54:

Were any of the other things that were with Mr. Walzel's laptop at the time it was stolen also stolen along with the laptop?

RESPONSE 54:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas additionally objects to this question to the extent it is duplicative of Question 53 hereinabove.

QUESTION 55:

If the answer to question 54 is yes, which things were stolen, and which were not?

RESPONSE 55:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas also objects to this request to the extent it is duplicative of Questions 53 and 54. SoCalGas additionally objects to this question to

the extent it is unintelligible in its reference to Question 54, which does not seek a response that can be further parsed as requested in this question.

QUESTION 56:

Please identify the words in the requested police report that support the answers provided in response to questions 54 and 55.

RESPONSE 56:

SoCalGas objects to this request as vague and ambiguous, particularly with reference to the term "police report." SoCalGas objects to this request to the extent it assumes SoCalGas has possession, custody, or control over a police report. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

See response to Question 3.

QUESTION 57:

What else relating to SS-25 was stolen when Mr. Walzel's laptop was stolen?

RESPONSE 57:

SoCalGas objects to this request on the grounds it is vague and ambiguous as the phrase "relating to." SoCalGas further objects to this question to the extent this question is duplicative of Questions 37 and 43. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request as asking whether any items related to Boots & Coots' well control efforts on SS-25, aside from any materials on Mr. Walzel's stolen laptop, were also stolen. No.

QUESTION 58:

Did Mr. Wenzel [*sic*] use an internet model to do his transient model calculations?

a. If yes, what internet service provided the model? Please provide the website address.

b. If yes, did Mr Wenzel [*sic*] enter data, run the model and download results and/or a report to his laptop?
c. If yes, does Mr. Wenzel [*sic*] have an online account with the service identified in response to a. above?
1. If yes, are the results and/or reports that were generated stored in his online account?
a. If yes, please provide the results/reports.

RESPONSE 58:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the terms "internet model." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

a-c. Mr. Walzel performed transient kill modeling using a licensed software called Drillbench. The transient kill modeling performed by Mr. Walzel is not available on an online platform.

QUESTION 59:

Was the transient model that Mr. Wenzel [*sic*] used a commercial product or something created by him, Boots & Coots or someone else?
a. If it was a commercial product, what is the name of the product and where can it be purchased or downloaded?
b. If it was created, please identify the person or company who created the model.

RESPONSE 59:

a-b. SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the phase "transient model that Mr. Wenzel [*sic*] used." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Mr. Walzel performed transient kill modeling using a licensed software called Drillbench. Drillbench is available for purchase from the company Schlumberger.

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(DATA REQUEST SED-SCG-57 DATED MARCH 26, 2020)

SOCALGAS RESPONSE DATED MAY 7, 2020

QUESTION 60:

Is the transient model a spreadsheet model? If yes, provide a copy in native format with any instructions that are available.

RESPONSE 60:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the demand to "provide a copy in native format." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

See responses to Questions 58 and 59.

AUTO THEFT DIVISION
(713) 308-3500

Houston Police Department

Incident No.: 165341515-M
Title: BURGLARY MOTOR VEHICLE
Address: 7318 W. FM 1960
Date: 12/26/15
Officer's Name: HC-TRAN

Unit No.: 5F43D
Crime Prevention: www.houstonpolice.org
Report Gang Tips: www.stophoustongangs.org

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

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(DATA REQUEST SED-SCG-57 DATED MARCH 26, 2020)

SOCALGAS SUPPLEMENTAL RESPONSE DATED MAY 19, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated March 26, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

SoCalGas understands from Boots & Coots that transient modeling prepared in support of well kill attempts 3-6 were saved on the laptop that was stolen from Mr. Walzel's vehicle.

<u>QUESTION 21:</u>

Did SoCalGas authorize the use of Mr. Walzel's transient models for each of the well kill attempts?

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RESPONSE 21 (DATED MAY 7, 2020):

SoCalGas objects to this question on the basis that it is vague and ambiguous and unintelligible with respect to the phrase "authorize the use of." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

The transient modeling helped inform the kill plans prepared by Boots & Coots. SoCalGas approved the kill plans that were prepared by Boots & Coots and ultimately used to implement each top kill attempt.

SUPPLEMENTAL RESPONSE 21 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objection, SoCalGas responds as follows. SoCalGas authorized Boots & Coots personnel to take all actions that were reasonable and necessary to bring SS-25 under control. While SoCalGas did not specifically and expressly request or authorize Boots & Coots to perform transient modeling for each top kill attempt, SoCalGas would have authorized Boots & Coots' use of transient modeling to the extent it was, in Boots & Coots' expert judgement, appropriate and advisable under the circumstances.

QUESTION 25:

Did SoCalGas review Mr. Walzel's transient models?

RESPONSE 25 (DATED MAY 7, 2020):

SoCalGas reviewed and approved the kill plans that were prepared by Boots & Coots and ultimately used to implement each top kill attempt. The transient modeling helped inform the kill plans prepared by Boots & Coots.

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SUPPLEMENTAL RESPONSE 25 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas evaluated the outputs of the transient modeling prepared by Mr. Walzel to the extent the modeling outputs were incorporated into the well kill plans Boots & Coots prepared in advance of each top kill attempt. However, SoCalGas did not review the transient modeling that resided only on Mr. Walzel's laptop and required licensed software to review.

QUESTION 26:

Did SoCalGas approve each of Mr. Walzel's transient models before the well kill attempt for which they were used?

RESPONSE 26 (DATED MAY 7, 2020):

SoCalGas objects to this question to the extent it is vague and ambiguous, particularly in reference to Question 21 of this data request, which asks whether SoCalGas "authorize[d]" the use of Mr. Walzel's transient models. SoCalGas further objects to this request to the extent it is duplicative of Question 21 herein. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this question to ask the same question posed in Question 21 herein. Accordingly, see SoCalGas' response to Question 21.

SUPPLEMENTAL RESPONSE 26 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objections, SoCalGas responds as follows. SoCalGas authorized Boots & Coots personnel to take all actions that were reasonable and necessary to bring SS-25 under control. While SoCalGas did not specifically and expressly request or authorize Boots & Coots to perform transient modeling for each top kill attempt, SoCalGas would have authorized and approved Boots & Coots' use of transient modeling to the extent it was in Boots &

Coots' expert judgement that it was appropriate and advisable under the circumstances.

QUESTION 27:

If not, why not?

RESPONSE 27 (DATED MAY 7, 2020):

SoCalGas objects to this question to the extent it is vague, ambiguous, and unintelligible to the extent it purports to ask a question without a premise. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Responses to Questions 21, 25 and 26.

SUPPLEMENTAL RESPONSE 27 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objections, SoCalGas responds as follows. SoCalGas authorized Boots & Coots personnel to take all actions that were reasonable and necessary to bring SS-25 under control. While SoCalGas did not specifically and expressly request or authorize Boots & Coots to perform transient modeling for each top kill attempt, SoCalGas would have authorized and approved Boots & Coots' use of transient modeling to the extent it was in Boots & Coots' expert judgement that it was appropriate and advisable under the circumstances.

QUESTION 28:

If SoCalGas approved of each of Mr. Walzel's transient models before the well kill attempt for which they were used, describe SoCalGas's review process of Mr. Walzel's transient models?

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RESPONSE 28 (DATED MAY 7, 2020):

SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "review process." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See Responses to Questions 21, 25, and 26.

SUPPLEMENTAL RESPONSE 28 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objection interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objection, SoCalGas responds as follows. Please see SoCalGas' Supplemental Responses to Questions 21, 25, 26, and 27.

QUESTION 29:

If SoCalGas approved of each of Mr. Walzel's transient models before the well kill attempt for which they were used, please identify the individual from SoCalGas who approved of Mr. Walzel's transient models?

RESPONSE 29 (DATED MAY 7, 2020):

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the use of the term "approved of." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A. See Responses to Questions 21, 25 and 26.

SUPPLEMENTAL RESPONSE 29 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objection, SoCalGas responds

as follows. Please see SoCalGas' Supplemental Responses to Questions 21, 25, 26, and 27.

QUESTION 53:

What else was with Mr. Walzel's laptop at the time it was stolen? Please be specific in answering this question. For example, if other equipment, notes, or other things were stolen, please describe them in detail.

RESPONSE 53 (DATED MAY 7, 2020):

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas additionally objects to this question to the extent it is compound, unintelligible, and internally inconsistent to the extent it asks SoCalGas to identify what items were "with Mr. Walzel's laptop at the time it was stolen," but later asks SoCalGas to identify items that "were stolen."

SUPPLEMENTAL RESPONSE 53 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objections, SoCalGas responds as follows. SoCalGas interprets this request as asking for a list of tangible items that were stolen from Mr. Walzel's vehicle, aside from Mr. Walzel's laptop. In responding to this request, SoCalGas specifically excludes items that may have been "with Mr. Walzel's laptop" at the time it was stolen, but which were not actually stolen (*e.g.*, Mr. Walzel's vehicle itself). Based on discussions with Boots & Coots' counsel, SoCalGas understands that Mr. Walzel's computer bag was stolen, which contained Mr. Walzel's laptop, passport, checkbook, an external hard drive, and some papers.

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QUESTION 55:

If the answer to question 54 is yes, which things were stolen, and which were not?

RESPONSE 55 (DATED MAY 7, 2020):

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas also objects to this request to the extent it is duplicative of Questions 53 and 54. SoCalGas additionally objects to this question to the extent it is unintelligible in its reference to Question 54, which does not seek a response that can be further parsed as requested in this question.

SUPPLEMENTAL RESPONSE 55 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objections, SoCalGas responds as follows. SoCalGas interprets this request as asking for a list of tangible items that were stolen from Mr. Walzel's vehicle, aside from Mr. Walzel's stolen laptop. In responding to this request, SoCalGas specifically excludes items that may have been "with Mr. Walzel's laptop" at the time it was stolen, but which were not actually stolen (*e.g.*, Mr. Walzel's vehicle itself). Based on discussions with Boots & Coots' counsel, SoCalGas understands that Mr. Walzel's computer bag was stolen, which contained Mr. Walzel's laptop, passport, checkbook, an external hard drive, and some papers.

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QUESTION 56:

Please identify the words in the requested police report that support the answers provided in response to questions 54 and 55.

RESPONSE 56 (DATED MAY 7, 2020):

SoCalGas objects to this request as vague and ambiguous, particularly with reference to the term "police report." SoCalGas objects to this request to the extent it assumes SoCalGas has possession, custody, or control over a police report. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

See Response to Question 3.

SUPPLEMENTAL RESPONSE 56 (DATED MAY 19, 2020):

SoCalGas provides this supplemental response pursuant to an agreement reached with SED at the parties' May 8, 2020 meet-and-confer. SoCalGas maintains and incorporates by reference the objections interposed in its initial response dated May 7, 2020. Subject to and without waiving SoCalGas' objections, SoCalGas responds as follows. The document SoCalGas previously produced with Bates number AC_CPUC_SED_DR_57_0000001 represents the record that the Houston Police department provided Mr. Walzel at the time he reported the theft of his laptop. The Houston Police Department did not detail in this record the items that were stolen from Mr. Walzel's vehicle. Neither Boots & Coots nor SoCalGas are in possession of any other report prepared by the Houston Police Department that provides any more detail than provided in document AC_CPUC_SED_DR_57_0000001.

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SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated March 26, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

QUESTION 1:

For this data request, please refer to the SoCalGas reply testimony, Chapter IV, "Prepared Reply Testimony of Danny Walzel and Dr. Arash Haghshenas on Behalf of Southern California Gas Company".

a. Please articulate the exact role that Danny Walzel assumed to kill well SS-25.

b. Please provide all invoices and other documents from Boots & Coots to SoCalGas for work done during the time of the well SS-25 leak that show the role Mr. Walzel assumed in killing well SS-25
c. Please articulate the exact role that Dr. Hagshenas assumed to kill well SS-25.
d. Please provide all invoices and other documents from Boots & Coots to SoCalGas for work done during the time of the well SS-25 leak that show the role Dr. Haghshenas assumed in killing well SS-25

RESPONSE 1:

a. SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the terms "role" and "assumed," and seeks information that is already within SED's possession or equally available to SED (see transcript of SED's examination under oath of Mr. Walzel, attached to SED's Opening Testimony). Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Mr. Walzel contributed to Boots & Coots' well control efforts beginning on October 25, 2015, and until he departed from Aliso Canyon on December 14, 2015. During this period Mr. Walzel held the position of Senior Well Control Engineer. Mr. Walzel was responsible for rigging-up equipment, preparing modeling in connection with the kill attempts, and preparing and physically implementing the pumping operations during kill attempt numbers 2–6. SoCalGas notes that Mr. Walzel was made available to SED on August 8, 2018 for an Examination Under Oath (EUO) at the California Public Utilities Commission's San Francisco Office. Further information regarding Mr. Walzel's role was provided to SED's five questioners during that EUO.

b. SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent it seeks invoices "that show the role Mr. Walzel assumed in killing well SS-25" "during the time of the well SS-25 leak." SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent it seeks "all invoices and other documents." SoCalGas further objects to this request to the extent it seeks documents already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas assumes

this question seeks the Boots & Coots Daily Reports that SoCalGas previously provided to SED. Please see electronic documents previously produced to SED (AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808).

c. SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the terms "role" and "assumed." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Dr. Haghshenas was involved in the SS-25 well control efforts beginning December 2, 2015[1] and ending February 18, 2016. During this period Dr. Haghshenas conducted transient modeling for the 7th top kill attempt. Dr. Haghshenas also prepared a model and ran simulations for the relief well used to control SS-25.

d. SoCalGas objects to this request on the grounds it is vague and ambiguous and unintelligible to the extent it seeks invoices "that show the role Dr. Haghshenas assumed in killing well SS-25" "during the time of the well SS-25 leak." SoCalGas further objects to this request to the extent it is overly broad and unduly burdensome to the extent it seeks "all invoices and other documents." SoCalGas further objects to this request to the extent it seeks documents already in SED's possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this question to seek the Boots & Coots Daily Reports. Please see documents previously produced to SED (AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808).

QUESTION 2:

Please refer to the following passages in the Chapter IV reply testimony, page 3 to answer rest of the questions in this data request, except for questions 32 and 33.

> Q: DID BOOTS & COOTS PERFORM TRANSIENT KILL MODELING PRIOR TO KILL ATTEMPT #7?

[1] SoCalGas notes that a typographical error appears in SoCalGas' Reply, Chapter IV (Walzel/Haghshenas) at page 2, line 3. The date "December 7" should be replaced with "December 2," as stated in this response.

> A: Yes. Boots & Coots performed transient kill modeling before kill attempt number seven. After Boots & Coots attempted its second well kill attempt on November 15, 2015, and before its well kill attempt on November 18 2015, and for additional kill attempts thereafter, Boots & Coots performed transient modeling.
>
> Q: DOES BOOTS & COOTS HAVE THE TRANSIENT MODELING RECORDS RELATED TO ITS SS-25 KILL ATTEMPTS?
>
> A: Only for the December 22, 2015, well kill. Danny Walzel had conducted the transient modeling for well kill prior to December 22, 2015. However, the transient modeling was done on his laptop. This laptop was stolen from him, along with other personal items, in late December 2015. Mr. Walzel reported the theft to the police. Mr. Walzel's transient modeling was not saved anywhere else, nor was it sent to anyone else.

With these passages in mind, please answer the following questions.

RESPONSE 2:

SoCalGas objects to this request to the extent it asks no question to which SoCalGas can respond.

QUESTION 3:

Provide the police report of the theft that Mr. Walzel reported to the police.

RESPONSE 3:

SoCalGas objects to this request on the grounds it is vague and ambiguous, particularly with respect to the term "police report." SoCalGas further objects to this request it seeks documents not in SoCalGas' possession. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. The Houston Police Department provided Mr. Walzel with a document regarding the reported theft of Mr. Walzel's laptop and other belongings, provided here bearing the following bates number: AC_CPUC_SED_DR_57_0000001.

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SOUTHERN CALIFORNIA GAS COMPANY

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SOCALGAS RESPONSE DATED MAY 7, 2020

QUESTION 4:

Did SoCalGas disclose the information in these passages to Blade Energy Partners (Blade) during Blade's Root Cause Analysis?

RESPONSE 4:

SoCalGas objects to this request to the extent it is vague and ambiguous regarding the terms "the information in these passages." SoCalGas further objects to this request to the extent it assumes Blade specifically asked SoCalGas to produce "transient modeling" in connection with the SS-25 well control efforts. SoCalGas further objects to this request to the extent it seeks information that is equally available to SED, as SED was copied on all data request responses provided to Blade Energy Partners in the course of Blade's investigation prior to issuing its Root Cause Analysis report. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Regarding the details described in the testimony excerpted by SED in the passage above, SoCalGas first became aware of this information cited in the excerpted passage on February 21, 2020, after Blade Energy Partners had issued its Root Cause Analysis Report.

QUESTION 5:

If the answer to question 4 is yes, provide documentation showing this, including the dates and the Blade data requests to which this information responded.

RESPONSE 5:

N/A. See response to Question 4.

QUESTION 6:

If the answer to question 4 is no, please explain why not.

RESPONSE 6:

See response to Question 4.

QUESTION 7:

When did SoCalGas first learn of the information provided in these passages?

RESPONSE 7:

SoCalGas objects to this request to the extent it is vague and ambiguous due to the compound nature of the question. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Question 4.

QUESTION 8:

Provide documentation showing the answer to question 7.

RESPONSE 8:

SoCalGas objects to this question to the extent it is vague and ambiguous and unintelligible to the extent it seeks documentation that SoCalGas was not aware of a fact. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

Please see SoCalGas Reply Testimony, Ex. III-4 (Danny Walzel Depo. (Feb. 21, 2020).)

QUESTION 9:

Beginning October 23, 2015 and continuing until well SS-25 was successfully killed, did SoCalGas have any procedures, plans, protocols, or other requirements in place that it be provided with records related to a well kill such as the well kills for SS-25, including transient modeling records?

RESPONSE 9:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrases "such as the well kills for SS-25," and "transient modeling records." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. No.

QUESTION 10:

If the answer to question 9 is yes, please provide all such requirements, and identify the page number and quoted excerpt or excerpts that support the answer.

RESPONSE 10:

N/A. Please see response to Question 9.

QUESTION 11:

Given that SoCalGas must comply with the safety requirements of California Public Utilities Code Section 451, please answer the following:

a. Does SoCalGas find it acceptable the assertion in Mr. Walzel's testimony that "Mr. Walzel's transient modeling was not saved anywhere else, nor was it sent to anyone else"?
b. Does SoCalGas take the position that it was appropriate for transient modeling of the SS-25 well kill attempts to not have been saved anywhere else than Mr. Walzel's laptop, and not to have been sent to anyone else?

RESPONSE 11:

a. SoCalGas objects to this question on the grounds it is vague, ambiguous and unintelligible with respect to the phrase "find it acceptable the assertion" and relation to Section 451 of the California Public Utilities Code. SoCalGas further objects to this request to the extent it calls for a legal conclusion. SoCalGas additionally objects to this request to the extent it constitutes an incomplete hypothetical.

b. SoCalGas objects to this question on the grounds it is vague and ambiguous with respect to the term "appropriate" and relation to Section 451 of the California Public Utilities Code. SoCalGas further objects to this request to the extent it calls for a legal conclusion. SoCalGas further objects to this request to the extent that it assumes that regulations and/or industry standards require that well control efforts necessarily require transient modeling.

QUESTION 12:

How many transient models were created for the kill attempts of SS-25?

RESPONSE 12:

SoCalGas objects to this question on the grounds it is vague, ambiguous and unintelligible with respect to the phrase "[h]ow many transient models." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this question to ask for the number of discrete models that were created in connection with the seven top kills attempted on SS-25. SoCalGas understands from Boots & Coots that Boots & Coots used software to prepare one discrete transient model in connection with top kill attempts 3-6, and a second discrete model for top kill attempt 7.

QUESTION 13:

Please list the number of transient models that were created for each well kill attempt of SS-25. Please be sure to include the date each model was completed, and the kill attempt for which each model was used.

RESPONSE 13:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrase "number of transient models." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

As described in SoCalGas' Reply Testimony, Boots & Coots performed transient kill modeling before its November 18, 2015 kill attempt and for each kill attempt thereafter.

However, the laptop containing the modeling for kill attempts 3-6 was stolen from Mr. Walzel's vehicle after he returned to Houston, and the laptop was never recovered. (*See*, SoCalGas' Reply Testimony Chapter IV (Walzel/Haghshenas) at 3.) Therefore, SoCalGas cannot provide the detail sought for the modeling that was conducted in support of top kill attempts 3-6. Transient modeling prepared in connection with the 7th kill attempt was prepared on or around December 16, 2015 and completed prior to the 7th kill attempt on December 22, 2015.

QUESTION 14:

Other than Mr. Walzel, did any other Boots & Coots employee, SoCalGas personnel member, or any other individual develop or produce, or help develop or help produce a transient model that was used to kill SS-25?

RESPONSE 14:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrases "develop or produce" and "help develop and produce." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas understands this request to seek information regarding the transient modeling prepared in connection with top kill attempts 3-7. Yes, another Boots & Coots employee prepared modeling in connection with the 7th top kill attempted on SS-25.

QUESTION 15:

If so, please identify each individual, the model they developed or produced, or helped develop or produce, the date the model was produced, and the kill for which the model was produced.

RESPONSE 15

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrases "develop or produce" and "help develop and produce." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

SoCalGas understands this request to seek information regarding the transient modeling prepared in connection with top kill attempts 3-7. In December 2015, Dr. Haghshenas of Boots & Coots helped develop a transient model in connection with the 7th top kill attempted on SS-25.

QUESTION 16:

Please provide each model identified in response to the prior question.

RESPONSE 16:

SoCalGas objects to this request to the extent it seeks information that is not in the custody or control of SoCalGas or Boots & Coots. SoCalGas further objects to this request as vague and ambiguous regarding the term "model." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. As noted in SoCalGas' Reply Testimony Chapter IV (Walzel / Haghshenas), and acknowledged by SED in Question 2 of this data request, only the transient kill modeling prepared in connection with the December 22, 2015 top kill attempt is within the possession, custody, or control of Boots & Coots. Therefore, SoCalGas interprets this request as seeking the transient model prepared in connection with Boots & Coots' seventh well kill attempt. However, the "model" itself cannot be reviewed without access to licensed modeling software. To the extent that SED seeks transient modeling data related to the seventh kill attempt, please see documents previously provided to SED: AC_CPUC_0173909 – AC_CPUC_0173913; AC_CPUC_0173168 – AC_CPUC_0173172.

QUESTION 17:

Did Mr. Walzel participate in all of the Boots & Coots well kill attempts?

RESPONSE 17:

SoCalGas objects to this request as vague and ambiguous, particularly with respect to the term "participate." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

No. As described in SoCalGas' Reply Testimony, Mr. Walzel contributed to Boots & Coots' well control efforts beginning on October 25, 2015 and until he departed from Aliso Canyon on December 14, 2015.

QUESTION 18:

Did Mr. Walzel take any notes related to the transient models that were not on his stolen laptop?

RESPONSE 18:

SoCalGas objects to this request as vague and ambiguous regarding the term "notes related to the transient models." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets "notes" as notes taken by Mr. Walzel and not correspondence. No. SoCalGas understands from Boots & Coots that all notes, if any, taken by Mr. Walzel would have been transcribed on his laptop that was later stolen from Mr. Walzel's vehicle.

QUESTION 19:

If so, please provide all such notes.

RESPONSE 19:

N/A. See response to Question 18.

QUESTION 20:

Please confirm that all transient models were actually SAVED on Mr. Walzel's stolen laptop.

RESPONSE 20:

SoCalGas objects to this question on the basis that it is vague and ambiguous and unintelligible with respect to the capitalization of the word SAVED. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

SoCalGas understands from Boots & Coots that transient modeling prepared in support of well kill attempts 3-6 were saved on the laptop that was stolen from Mr. Walzel's vehicle.

QUESTION 21:

Did SoCalGas authorize the use of Mr. Walzel's transient models for each of the well kill attempts?

RESPONSE 21:

SoCalGas objects to this question on the basis that it is vague and ambiguous and unintelligible with respect to the phrase "authorize the use of." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

The transient modeling helped inform the kill plans prepared by Boots & Coots. SoCalGas approved the kill plans that were prepared by Boots & Coots and ultimately used to implement each top kill attempt.

QUESTION 22:

Was a different transient model created for each well kill attempt?

RESPONSE 22:

SoCalGas objects to this request to the extent it is duplicative of Questions 12 and 13. Subject to and without waiving the foregoing objection, SoCalGas responds as follows. See response to Questions 12 and 13.

QUESTION 23:

If so, please identify each well kill attempt for which a transient model was used.

RESPONSE 23:

SoCalGas objects to this question to the extent it seeks information that is already in the possession of SED. SoCalGas further objects to this request to the extent it is duplicative of Questions 12 and 13. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See responses to Questions 12 and 13 herein. As stated in SoCalGas' Reply Testimony Chapter IV (Walzel / Haghshenas), transient modeling was performed for each well kill performed by Boots & Coots after Boots & Coots' second attempt.

QUESTION 24:

If not, why not?

RESPONSE 24:

SoCalGas objects to this question to the extent it is vague, ambiguous, and unintelligible to the extent it purports to ask a question without a premise. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.
See responses to Questions 22 and 23.

QUESTION 25:

Did SoCalGas review Mr. Walzel's transient models?

RESPONSE 25:

SoCalGas reviewed and approved the kill plans that were prepared by Boots & Coots and ultimately used to implement each top kill attempt. The transient modeling helped inform the kill plans prepared by Boots & Coots.

QUESTION 26:

Did SoCalGas approve each of Mr. Walzel's transient models before the well kill attempt for which they were used?

RESPONSE 26:

SoCalGas objects to this question to the extent it is vague and ambiguous, particularly in reference to Question 21 of this data request, which asks whether SoCalGas "authorize[d]" the use of Mr. Walzel's transient models. SoCalGas further objects to this request to the extent it is duplicative of Question 21 herein. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this question to ask the same question posed in Question 21 herein. Accordingly, see SoCalGas' response to Question 21.

QUESTION 27:

If not, why not?

RESPONSE 27:

SoCalGas objects to this question to the extent it is vague, ambiguous, and unintelligible to the extent it purports to ask a question without a premise. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See responses to Questions 21, 25 and 26.

QUESTION 28:

If SoCalGas approved of each of Mr. Walzel's transient models before the well kill attempt for which they were used, describe SoCalGas's review process of Mr. Walzel's transient models?

RESPONSE 28:

SoCalGas objects to this request to the extent it is vague and ambiguous, particularly with respect to the term "review process." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. See responses to Questions 21, 25, and 26.

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QUESTION 29:

If SoCalGas approved of each of Mr. Walzel's transient models before the well kill attempt for which they were used, please identify the individual from SoCalGas who approved of Mr. Walzel's transient models?

RESPONSE 29:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the use of the term "approved of." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. N/A. See responses to Questions 21, 25 and 26.

QUESTIONS 30:

Please define in detail the process behind creating a transient well model.

a. For example, what are the inputs?
b. What are the outputs?
c. Etc.

RESPONSE 30:

SoCalGas objects to this question on the grounds it is vague and ambiguous with respect to the request to "define" a "process," and unintelligible at subpart (c) of the question. SoCalGas further objects to this request to the extent that it seeks information that is equally available to SED and does not require discovery from SoCalGas nor its testifying witnesses.

QUESTION 31:

Consistent with industry practice, please state all steps and calculations necessary to produce a transient well model.

RESPONSE 31:

SoCalGas objects to this question to the extent it is vague and ambiguous with respect to the phrase, "Consistent with industry practice" – this phrase renders the question posed unintelligible. SoCalGas further objects to this request to the extent that it seeks information that is equally available to SED and does not require discovery from SoCalGas nor its testifying witnesses.

QUESTION 32:

Please state all steps and calculations that were taken to produce the transient well models that Mr. Walzel's testimony asserts that were done for the well SS-25 kill attempts.

RESPONSE 32:

SoCalGas objects to this question on the grounds it is vague and ambiguous and unintelligible with respect to the phrase "the transient well models that Mr. Walzel's testimony asserts that were done for the well SS-25 kill." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Based on conversations with Boots & Coots, SoCalGas understands that Mr. Walzel prepared modeling for kill attempts 3-6 using Drillbench. The preparation of the model included the following general steps: (1) define the wellbore parameters, including the trajectory, casing, drill pipe and tubing; (2) define the kill fluid properties; (3) define reservoir properties, such as the reservoir fluid, and the reservoir capabilities for the blowout condition; (4) define the flow path, and surface condition; and (5) define the temperature profile in the wellbore.

QUESTION 33:

Did SoCalGas or any entity that it hired conduct transient modeling related to its SS-25 kill attempts after December 22, 2015?

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RESPONSE 33:

SoCalGas objects to this question on the basis that it is vague and ambiguous with respect to the phrase "transient modeling related to its SS-25 kill attempts." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. SoCalGas interprets this request as seeking whether SoCalGas or any entity that it hired conducted transient modeling to assist with SS-25 top kill attempts after December 22, 2015. No, the final top kill attempt was executed on December 22, 2015.

QUESTION 34:

If the answer to question 33 is yes, please provide the transient modeling records showing the answer.

RESPONSE 34:

N/A. See response to Question 33.

QUESTION 35:

If the answer to question 33 is yes, please explain why such models were conducted.

RESPONSE 35:

N/A. See response to Question 33.

QUESTION 36:

If the answer to question 33 is no, why not?

RESPONSE 36:

N/A. See response to Question 33.

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QUESTION 37:

Were any other records related to SoCalGas's SS-25 kill attempts on Mr. Walzel's stolen laptop?

RESPONSE 37:

SoCalGas objects to the question to the extent it is vague and ambiguous with respect to the phrase "any other records" – the predicate has not been established. SoCalGas further objects to this request to the extent that it seeks information that is not in the possession, custody or control of Boots & Coots, or SoCalGas. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

SoCalGas interprets this question to ask whether Mr. Walzel retained information other than the transient kill models referenced in SoCalGas' Reply Testimony, Chapter IV (Walzel / Haghshenas) on page 3, on his laptop. Mr. Walzel's laptop was stolen over four years ago, and has not since been recovered. SoCalGas has inquired with Boots & Coots, and without having access to Mr. Walzel's stolen laptop, neither Boots & Coots nor SoCalGas is able to respond to this request.

QUESTION 38:

If the answer to question 37 is yes, please list them.

RESPONSE 38:

SoCalGas objects to this request on the ground it is overly broad and unduly burdensome. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Mr. Walzel's laptop was stolen over four years ago, and has not since been recovered. SoCalGas has inquired with Boots & Coots, and without having access to Mr. Walzel's stolen laptop, neither Boots & Coots nor SoCalGas is able to respond to this request.

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QUESTION 39:

For each of the records listed in response to question 37, please state whether the record was saved elsewhere (e..g, a main server, on portable drive, etc.), or sent to another person. For each record that was saved elsewhere or sent to another person, please identify where the record was saved and to whom the record was sent.

RESPONSE 39:

SoCalGas objects to this request on the grounds the question is overly broad and unduly burdensome. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

N/A. See response to Question 38.

QUESTION 40:

Please describe the purpose of each record listed in response to question 37.

RESPONSE 40:

N/A. See response to Question 38.

QUESTION 41:

Was Mr. Walzel's stolen laptop recovered?

RESPONSE 41:

No. See responses to Questions 13 and 37.

QUESTION 42:

If the answer to question 41 is yes, were any of the transient models on it?

RESPONSE 42:

N/A. See response to Question 41.

QUESTION 43:

If the answer to question 41 is yes, were any other records related to SoCalGas's SS-25 kill attempts on it?

RESPONSE 43:

N/A. See response to Question 41.

QUESTION 44:

From what exact location was Mr. Walzel's laptop stolen?

RESPONSE 44:

7138 Farm to Market 1960 Rd. W, Houston Texas, 77070.

QUESTION 45:

When it was stolen, was Mr. Walzel's laptop inside a secure space that was somehow protected against property inside of it being stolen?

RESPONSE 45:

SoCalGas objects to this request on the ground it is vague and ambiguous with respect to the phrases "secure space" and "somehow protected against property inside of it being stolen." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

Mr. Walzel's laptop was locked inside of his truck.

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QUESTION 46:

If the answer to question 45 is yes, please describe the secure space, and all protections that the space had in place to protect against stolen property.

RESPONSE 46:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." Subject to and without waiving the foregoing objection, SoCalGas responds as follows. Please see Response to Question 45.

QUESTION 47:

If Mr. Walzel's laptop was not inside a secure space when stolen, why not?

RESPONSE 47:

N/A. See responses to Questions 45 and 46.

QUESTION 48:

For prior SoCalGas well kill attempts (both for SS-25 and others), have any transient modeling records been stolen from SoCalGas or its employees or contractors?

RESPONSE 48:

SoCalGas objects to the question to the extent it is vague and ambiguous with respect to the phrase "transient modeling records." SoCalGas objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

Aside from the transient modeling that was contained on Mr. Walzel's stolen laptop, SoCalGas is not aware of any other property theft in connection with the SS-25 incident.

QUESTION 49:

If so, please list them.

RESPONSE 49:

SoCalGas objects to this question on the grounds it is vague and ambiguous to the extent it poses a request without any reference. Subject to and without waiving the foregoing objection, SoCalGas responds as follows: N/A. Please see response to Question 48.

QUESTION 50:

For prior well kill attempts, has SoCalGas ever allowed its contractor to keep transient modeling records, but not save the records anywhere other than their laptop, and not send the records to anyone else?

RESPONSE 50:

SoCalGas objects to this request on the grounds it is vague and ambiguous with respect to the phrase "transient modeling records," and compound, argumentative, and overly broad and unduly burdensome to the extent it is not limited to any time frame to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

The use of transient modeling is not a widely utilized practice in the industry for controlling well failures by top kill. Aside from the SS-25 incident, SoCalGas has never worked with a contractor that prepared transient kill modeling for a well control operation at Aliso Canyon.

QUESTION 51:

If so, please list all such instances.

RESPONSE 51:

SoCalGas objects to this question to the extent it makes a request without any reference. Subject to and without waiving the foregoing objection, SoCalGas responds as follows: N/A. Please see response to Question 50.

QUESTION 52:

With regards to the well kill attempts of SS-25, did Boot & Coots use transient modeling for any earlier attempt to inform the decision making related to any later attempt?

RESPONSE 52:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the terms "earlier attempt" and "later attempt" and the phrase "inform the decision making related to." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Yes.

QUESTION 53:

What else was with Mr. Walzel's laptop at the time it was stolen? Please be specific in answering this question. For example, if other equipment, notes, or other things were stolen, please describe them in detail.

RESPONSE 53:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this

proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas additionally objects to this question to the extent it is compound, unintelligible, and internally inconsistent to the extent it asks SoCalGas to identify what items were "with Mr. Walzel's laptop at the time it was stolen," but later asks SoCalGas to identify items that "were stolen."

QUESTION 54:

Were any of the other things that were with Mr. Walzel's laptop at the time it was stolen also stolen along with the laptop?

RESPONSE 54:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas additionally objects to this question to the extent it is duplicative of Question 53 hereinabove.

QUESTION 55:

If the answer to question 54 is yes, which things were stolen, and which were not?

RESPONSE 55:

SoCalGas objects to this request to the extent it is unduly burdensome pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and the "burden, expense, or intrusiveness of that discovery clearly outweighs the likelihood that the information sought will lead to the discovery of admissible evidence." SoCalGas further objects to this request to the extent it seeks information that is beyond the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019. SoCalGas also objects to this request to the extent it is duplicative of Questions 53 and 54. SoCalGas additionally objects to this question to

the extent it is unintelligible in its reference to Question 54, which does not seek a response that can be further parsed as requested in this question.

QUESTION 56:

Please identify the words in the requested police report that support the answers provided in response to questions 54 and 55.

RESPONSE 56:

SoCalGas objects to this request as vague and ambiguous, particularly with reference to the term "police report." SoCalGas objects to this request to the extent it assumes SoCalGas has possession, custody, or control over a police report. Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

See response to Question 3.

QUESTION 57:

What else relating to SS-25 was stolen when Mr. Walzel's laptop was stolen?

RESPONSE 57:

SoCalGas objects to this request on the grounds it is vague and ambiguous as the phrase "relating to." SoCalGas further objects to this question to the extent this question is duplicative of Questions 37 and 43. Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request as asking whether any items related to Boots & Coots' well control efforts on SS-25, aside from any materials on Mr. Walzel's stolen laptop, were also stolen. No.

QUESTION 58:

Did Mr. Wenzel [*sic*] use an internet model to do his transient model calculations?

a. If yes, what internet service provided the model? Please provide the website address.

b. If yes, did Mr Wenzel [*sic*] enter data, run the model and download results and/or a report to his laptop?
c. If yes, does Mr. Wenzel [*sic*] have an online account with the service identified in response to a. above?
1. If yes, are the results and/or reports that were generated stored in his online account?
a. If yes, please provide the results/reports.

RESPONSE 58:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the terms "internet model." Subject to and without waiving the foregoing objections, SoCalGas responds as follows.

a-c. Mr. Walzel performed transient kill modeling using a licensed software called Drillbench. The transient kill modeling performed by Mr. Walzel is not available on an online platform.

QUESTION 59:

Was the transient model that Mr. Wenzel [*sic*] used a commercial product or something created by him, Boots & Coots or someone else?
a. If it was a commercial product, what is the name of the product and where can it be purchased or downloaded?
b. If it was created, please identify the person or company who created the model.

RESPONSE 59:

a-b. SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the phase "transient model that Mr. Wenzel [*sic*] used." Subject to and without waiving the foregoing objections, SoCalGas responds as follows. Mr. Walzel performed transient kill modeling using a licensed software called Drillbench. Drillbench is available for purchase from the company Schlumberger.

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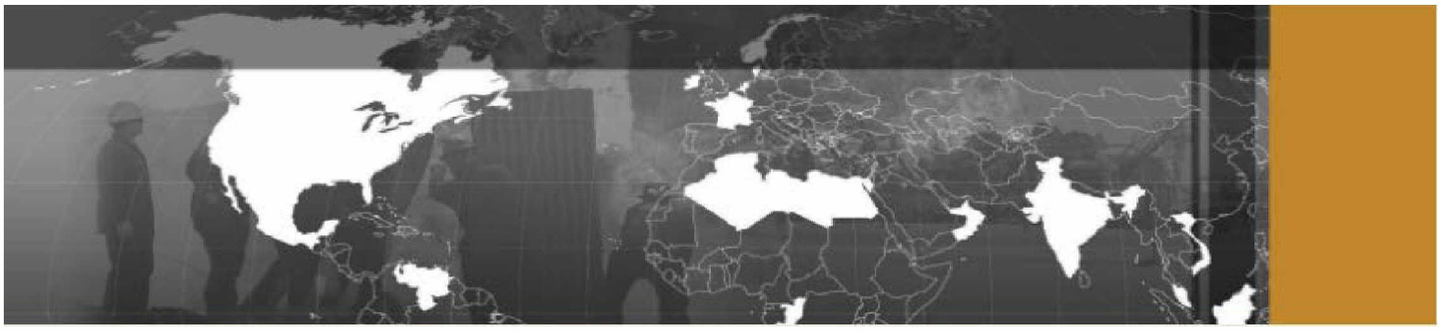
QUESTION 60:

Is the transient model a spreadsheet model? If yes, provide a copy in native format with any instructions that are available.

RESPONSE 60:

SoCalGas objects to this request to the extent it is vague and ambiguous with respect to the demand to "provide a copy in native format." Subject to and without waiving the foregoing objection, SoCalGas responds as follows.

See responses to Questions 58 and 59.



Dynamic Kill Analysis

SoCalGas

Porter 39A

Prepared for: SoCalGas

Document Date: December 14, 2015

Document Version: 4

Document Reference: Dynamic kill analysis Porter 39A

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REPORT RELEASE DATA SHEET

Dynamic Kill Analysis for Porter 39A

Distribution :	SoCalGas Boots & Coots Services	**Date :** **Pages :** **Revision :**	December 14, 2015 16 4
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Authors :	Dr. Arash Haghshenas	**Signatures :**	
Reviewed by :			

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Abstract:

This report covers dynamic kill analysis for Southern California Gas Company, Porter 39A.

Disclaimer:

The engineering and operational recommendations presented in this report, are formulated upon the information and data available to Boots & Coots and conveyed to us by the client. Engineering and operational recommendations are thusly based upon experience and what Boots & Coots considers industry accepted practices or otherwise believed to be prudent and proper, necessary to address the subject issue. Boots & Coots reserves the right to amend or otherwise revise our position, if any additional, meaningful information becomes available at any subsequent time.

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1 EXECUTIVE SUMMARY

This report presents the key results from a blowout and dynamic kill analysis performed for *SoCalGas, Porter 39A* well as part of relief well planning. The blowout rate and dynamic kill analysis is based on the worst-case discharge analysis. The analysis is based on the worst-case blowout scenario of 50 MMscfd. The blowout rate and dynamic kill analysis shall be revised in case of more data regarding the flow rate become available. The relief well intercepts Porter 39A between the packer and top of perforated liner. Simulation analysis indicates that successful dynamic kill operation is achieved by pumping 9.0 or 10.0 ppg kill fluids at the rate of 10 bpm. Due to the depleted zone and the presence of high permeability environment, significant losses are expected.

Target well data:		**Relief well data:**	
MD/TVD:	8,749 ft / 8,728 ft	MD/TVD:	8, 536 ft / 8,093 ft
Last casing:	7” @ 8,585 ft MD	Last casing/liner:	7” liner
Slotted liner ID:	4.8”	Interception depth:	8,550 ft of target well
		Max. DLS:	5.0 deg/100 ft
		Max. Inclination:	40.0°

Reservoir data:		**Estimated blowout condition :**	
Top of reservoir:	8,590 ft MD	Gas rate:	50 MMscfd
Reservoir top pressure:	2,400 psi	Condensate rate:	0 BPD
CGR:	0 bbl/MMscfd	FBHP:	1,060 psi
WGR:	0 bbl/MMscfd		

Summary of dynamic kill analysis	**No restriction**	**Restricted**
Number of relief wells:	1	1
Density of kill fluid:	9.0 ppg	9.0 ppg
Maximum pump rate:	10 bpm	10 bpm
Max. pump pressure:*	3,00 psi @ 5 bpm	800 psi @ 5 bpm
Minimum required pumping capability:*	50 HHP	100 HHP
Kill fluid volume to stop the influx:	150 bbls	120 bbls
Minimum required kill fluid volume:**	580 bbls	500 bbls

*: Pressure loss of 100 psi is considered through surface lines.

**: Does not consider losses during the dynamic kill operation.

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Dynamic kill analysis indicates that the dynamic kill is dominated by the u-tube of kill fluid into the target well. The pump rate of 10.0 bpm allowed for the relief well full of kill fluid to stop the influx via u-tube effect. After the influx has stopped, losses are expected. Therefore, treatments for managing losses and maintaining hydrostatic pressure in the target well should be planned. Generally kill fluid volume equal to 4 times the volume of the target well is recommended.

The required pump rate capacity is within the capability of HQ-2000, also known as Grizzly pumps. Minimum of 2 pumps are recommended for performing the dynamic kill operation.

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2 INTRODUCTION

2.1 Purpose of the Document

Following a well control event and broach of gas to the surface, *SoCalGas* is drilling a relief well for Porter 39A and resolve the situation. As part of relief well plan, Boots & Coots performs dynamic kill analysis to evaluate the required kill fluid properties and volume.

The objectives of the finished document are to:

A worst-case discharge scenario is established based on the current well condition. The dynamic kill analysis is performed for the worst-case scenario to evaluate the challenges associated with the operation.

Based on the results of dynamic kill analysis, Operator's management and expert consultants would be able to determine required equipment, facility, and surface layout of the operation.

Incident command team would be able to evaluate risk and plan for eliminating or mitigating associated risks to the relief well design and dynamic kill requirement.

A systematic approach to blowout control preparedness is the key to emergency response. The successful planning and execution of a complicated blowout intervention operation requires the careful coordination of several specialized technical disciplines. Furthermore, the development of a strategy is an iterative process. It requires evaluating alternative plans, analyzing risks, and making tradeoffs, prior to reaching agreement between the operator, partners, and regulatory authorities.

All blowouts and subsequent intervention techniques are inherently different. Management of Change may be required as the well condition changes or other unknown hazards are exposed.

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2.2 Well Schematics

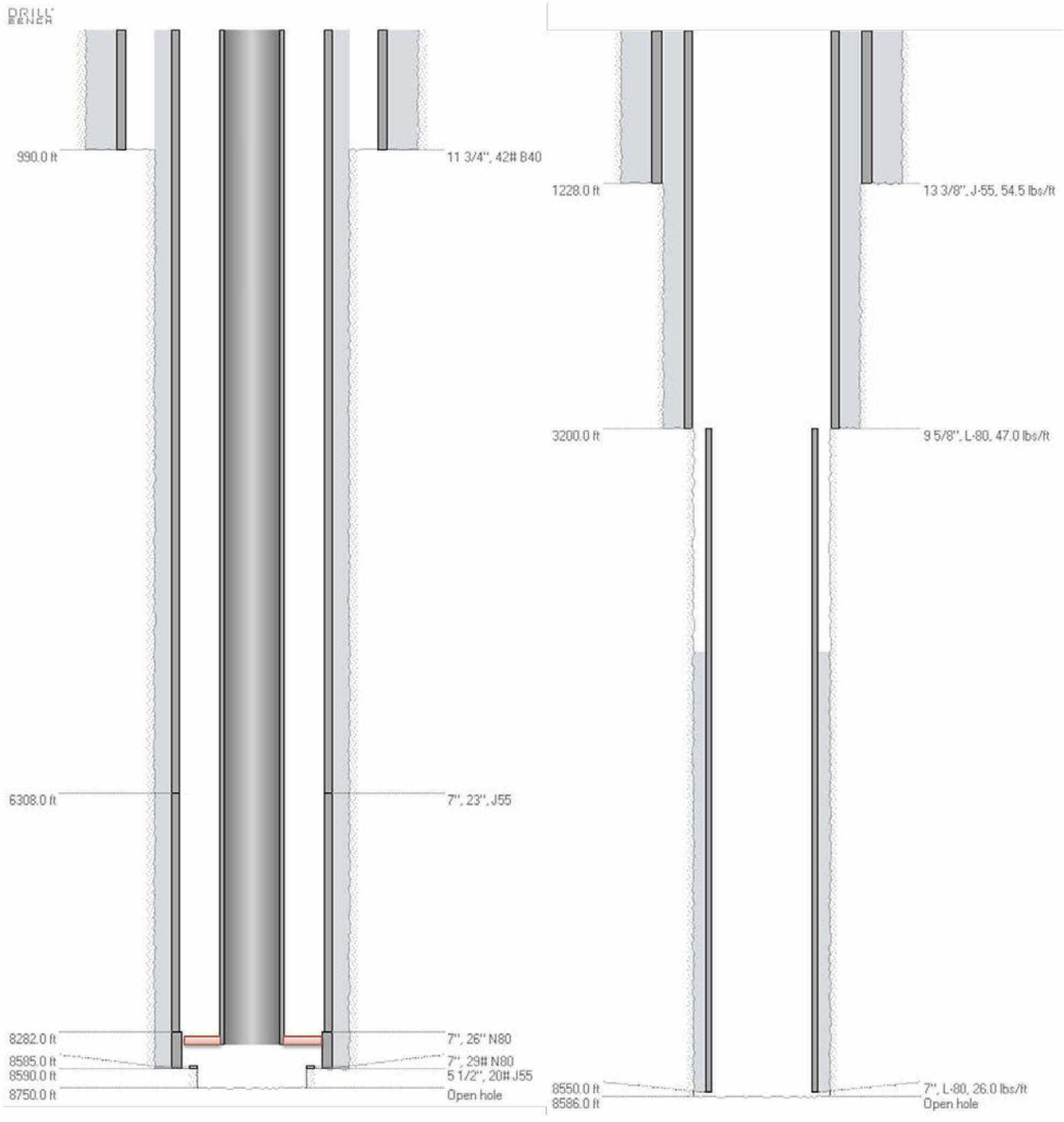

Figure 1 – Wellbore Schematic of the target well (left) and relief well (right)

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2.3 Relief Well Casing Configuration

The casing design of the target well includes setting a 9 5/8" casing at 8,585 ft MD (8,567 ft TVD). The integrity of the target well at the bottomhole condition is questionable. Therefore, the risk of encountering gas while approaching the target well prior to planned interception may exist. Also, given the degree of depletion sever losses may occur before making full contact with the target well. Given both consideration, it is suggested to confirm that the integrity of the casing shoe for a wellbore evacuated by formation fluid.

Total wellbore evacuation and wellbore integrity analysis was performed to provide recommendations on setting depth of casing shoe. Reservoir pressure of 2,400 psi pressure was considered. The maximum expected surface pressure with full column of gas is less than 2,000 psi. The maximum pressure at the casing shoe of the 13 3/8" casing is 2,176 psi, which exceeds the expected fracture gradient. Therefore, it is recommended to set additional casing in the relief well to ensure the integrity of the relief well.

Fracture pressure and hydrostatic gas column pressure analysis indicated that additional casing may be required at the depth of 2,900 ft TVD or greater to support a full column of gas in the relief well. After considering the geological properties and relief well drilling operations, interval of 3,200 to 3,400 ft TVD is suggested for set ting a 9 5/8" casing, where competent formation is present. Also, the proposed depth does not interfere with relief well drilling operation. The maximum expected pressure at 3,200 ft TVD is 2,280 psi where fracture pressure of 2,560 psi is expected. As result a safety margin of 280 psi would be present. The safety margin for a shoe set at 3,400 ft TVD is 430 psi. **Table 1** summarizes the casing shoe depth analysis from well control perspective.

Table 1 – Casing shoe integrity analysis

Depth, ft TVD	*Expected fracture pressure (psi)*	*Maximum pressure (psi)*	*Safety margin (psi)*
2,900	2,320	2,265	55
3,000	2,400	2,270	130
3,100	2,480	2,275	205
3,200	2,560	2,280	280
3,300	2,640	2,285	355
3,400	2,720	2,290	430

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2.4 Drill pipe and BHA Configuration

The drillstring in the relief well consists of 5,580 ft of 3 ½" drillpipe and 2,920 ft of 5" drillpipe.

2.5 Reservoir and Fluid Data

Table 2 presents the input data for the reservoir properties and characteristics. The reservoir fluid is considered to be gas with specific gravity of 0.65. Flow of condensate and water are not considered in the analysis. As the worst-case scenario, flow rate of 50 MMscfd is considered.

The reservoir pressure in the simulation is 2,400 psi. It is known that the production from the offset wells assist pressure depletion from Porter 39A. The effect of depletion is not considered to provide more conservative analysis.

Table 2 – Reservoir Data

Top reservoir depth, ft TVD	8,585
Reservoir temperature, ºF	160
Reservoir pressure, psi	2,400
AOF, MMscfd	58
CGR, bbls/MMscfd	0
WGR, bbls/MMscfd	0

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3 BLOWOUT AND KILL ANALYSIS

The blowout simulation was performed worst case discharged rate of 50 MMscfd. A pump pressure loss of 100 psi at the surface is assumed and is an estimation of pressure loss incurred by pumping through surface piping to the relief well.

The dynamic kill operation consists of the following phases:

- The dynamic kill phase involves a constant pump rate from the relief well until the bottomhole pressure in the relief well exceeds the pore pressure of the reservoir and the influx stops. Initially, the flowing bottomhole pressure is significantly less than the hydrostatic pressure of the kill fluid in the relief well. Therefore, kill fluid u-tubes into the target well.
- The next phase begins when the bottomhole pressure is above the pore pressure. The pump rate will be reduced gradually to stabilize the bottomhole pressure without fracturing the formation in the relief well. The pumping pressure will need to be monitored carefully to keep a dynamic pressure profile below fracturing in the open wellbore.
- When a stable pressure response is seen while pumping at a fairly low rate, additional volumes of kill fluid should be pumped to ensure that all remnant hydrocarbons are removed from the wellbore. This is to avoid any restart of the blowout due to rising hydrocarbons in the wellbore.
- Finally, a static kill is achieved when all hydrocarbons have been removed from the wellbore and the pumping can be stopped.
- In Event of experiencing or expecting fluid loss, the kill fluid should be treated to mitigate losses.

The simulator used to perform the blowout estimation and the dynamic kill analysis was Drillbench Blowout Control (OLGA-ABC), a transient flow model based on OLGA computation engine. Based on the conservative assumptions used in the modeling, simulator generally provides conservative results for the kill rate and the required kill fluid volume.

3.1 Blowout rate estimation

The model was set up to provide gas blowout rate of 50 MMscfd. Roughness value of 0.0018 inch has been considered for tubular to estimate the blowout rate and frictional pressure calculations. **Table 3** presents the summary of the blowout condition.

Table 3 - Blowout rate estimation at seabed

Formation name	*Gas rate (MMscfd)*	*Condensate rate (BPD)*	*FBHP (psi)*
Tuntong-1	50	0	1,060

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Figure 2 shows the wellbore condition during blowout. The plot on the left represents gas blowout rate in MMscf/day. The plot in middle top presents the annular pressure profile in the target well and the plot below it shows the annular velocity profile of the gas in the target well. Flowing bottomhole pressure and casing shoe pressure versus time are presented on the right side of the Figure 2. The bottomhole pressure is 1,060 psi.

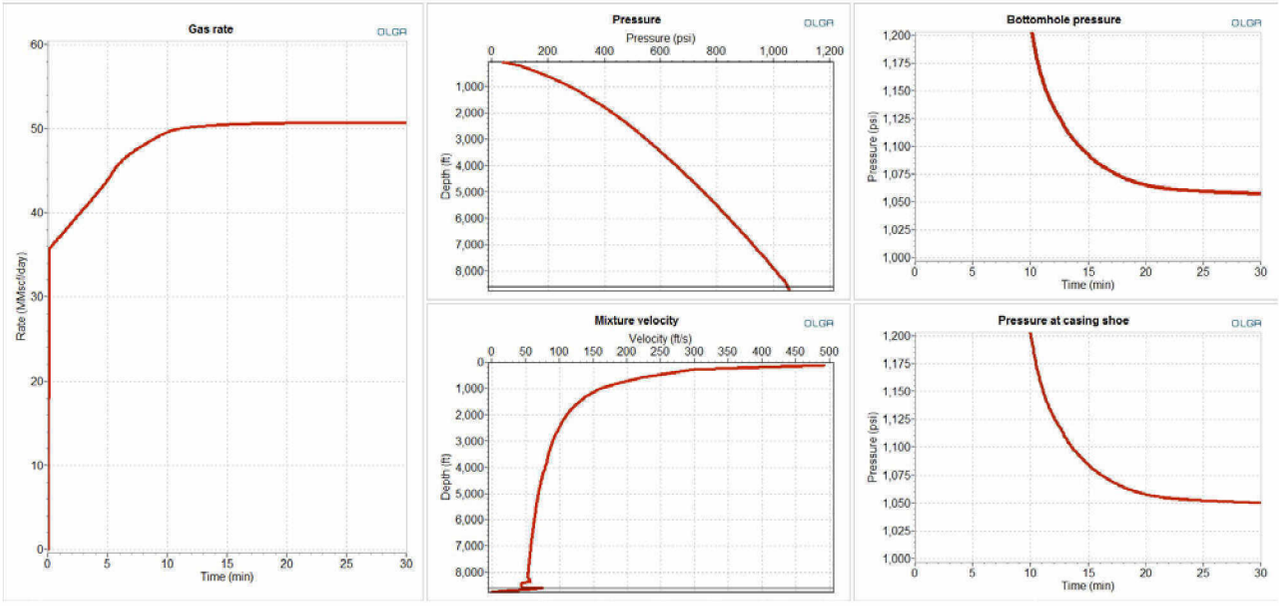

Figure 2 – Tuntong-1: Wellbore condition during blowout. Gas blowout rate reaches 935 MMscfd.

3.2 Dynamic Kill Results

Several different kill fluid densities and pump rate combinations were investigated. The drilling program calls for drilling fluid density in the range of 8.8 to 9.6 ppg. Kill fluid density of 9.0 ppg was considered as the lowest range for the kill fluid density. Simulation result indicted that successful dynamic kill can be achieved with 9.0 ppg kill fluid without excessive pumping requirement. Therefore dynamic kill analysis with heavier fluid was not considered.

Dynamic kill analysis was performed for two scenarios. The first scenario assumes no or minimum restriction in the wellbore of the target well. The second scenario considers a restriction in the annulus of the target well. The restriction could present either loss of packer seal or any other induced restriction immediately above the interception depth.

3.2.1 Scenario 1 – No restriction

The first scenario assumes that there is no restriction in the wellbore and the kill fluid is directly pumped in to the 7" by 2 7/8" annulus of the target well. **Figure 3** shows the snapshot of the dynamic kill simulation at the end of dynamic kill analysis. The influx stopped after 7 minutes of pumping or pumping 70 bbls of the kill

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fluid. During the pumping period about 80 bbls of the kill fluid from the relief well u-tubes into the target well. Therefore, total of 150 bbls of kill fluid is required to stop the influx. The instantaneous u-tube rate may reach 50 bpm and it is not possible to keep the target well full of kill fluid.

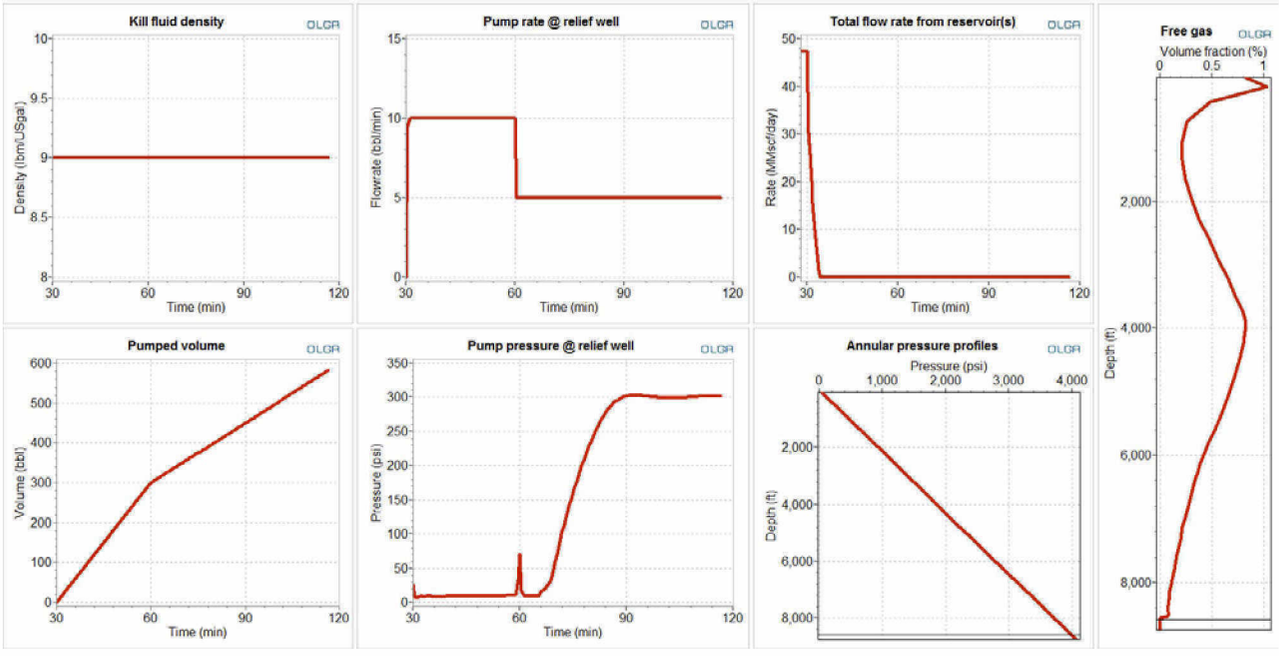

Figure 3 – Influx from the reservoir stops after pumping 150 bbls of 9.0 ppg kill fluid at the rate of 10 bpm.

After the relief well is full of kill fluid, the pumping rate was reduced to 5 bpm to circulate the remnant of the gas out of the wellbore. The maximum expected pressure during the dynamic kill simulation is 300 psi. The required hydraulic power for pumping the kill fluid is 50 HHP. Minimum kill fluid volume of 580 bbls is required. Additional kill fluid should be considered to expected losses and additional bottoms-up to ensure gas free environment in the target well.

3.2.2 Scenario 2 – Restricted flow

Previous pumping operations indicated sudden increase in pump pressure, which was associated to either a restriction in the annulus or screening effect at the sand face. Although the nature of the flow restriction is not known, the simulation was set up to consider for a restriction above the interception point. Equivalent pressure drop through restriction while pumping 9.0 ppg kill fluid at 5 bpm would be about 400 psi. A restriction in the flow was constructed in the annulus of the target well immediately above the interception point. The clearance between the restriction and the ID of the casing is 0.2 inch. The second scenario assumes that there is a 0.2" which was selected based on the observed pressure spike after pumping 70 bbls of fluid through the tubing during previous operations. The actual nature of the pressure spike is not known. **Figure 4** shows the snapshot of the dynamic kill simulation at the end of dynamic kill analysis. The influx stopped after 6 minutes of pumping or pumping 60 bbls of the kill fluid. During the pumping period

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about 60 bbls of the kill fluid from the relief well u-tubes into the target well. Therefore, total of 120 bbls of kill fluid is required to stop the influx.

After the relief well is full of kill fluid, the pumping rate was reduced to 5 bpm to circulate the remnant of the gas out of the wellbore. The maximum expected pressure during the dynamic kill simulation is 800 psi. The required hydraulic power for pumping the kill fluid is 100 HHP. Minimum kill fluid volume of 500 bbls is required. Additional kill fluid should be considered to expected losses and additional bottoms-up to ensure gas free environment in the target well.

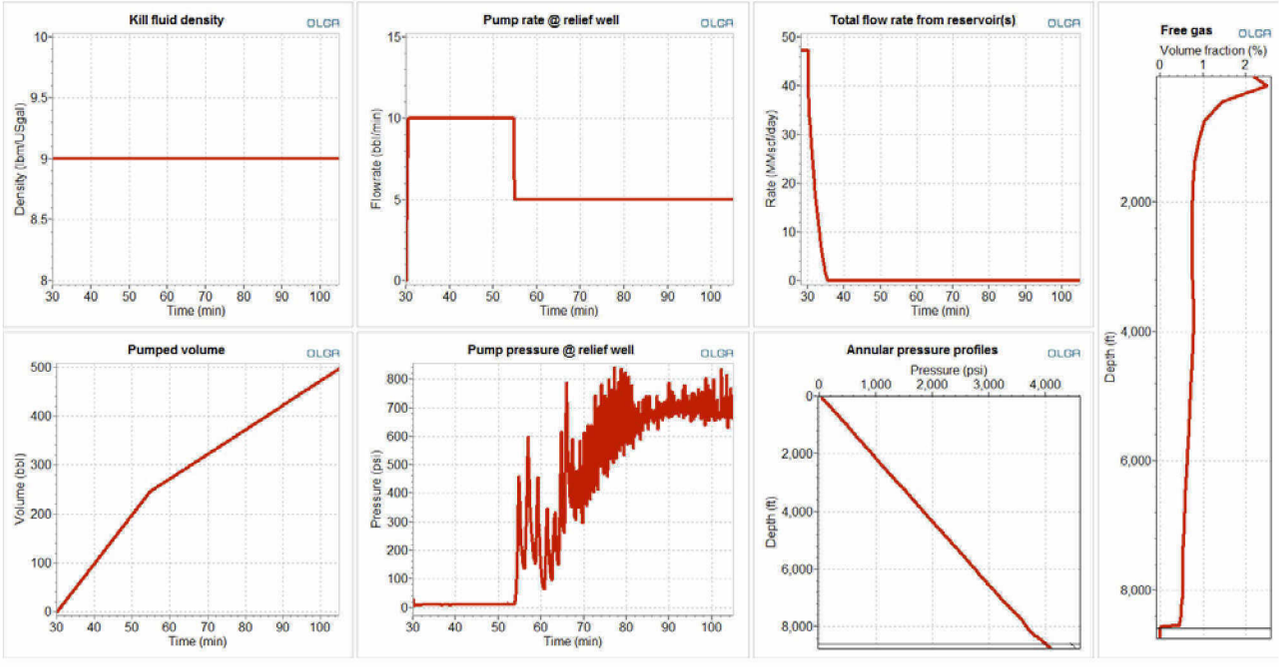

Figure 4 – Influx from the reservoir stops after pumping 120 bbls of 9.0 ppg kill fluid at the rate of 10 bpm.

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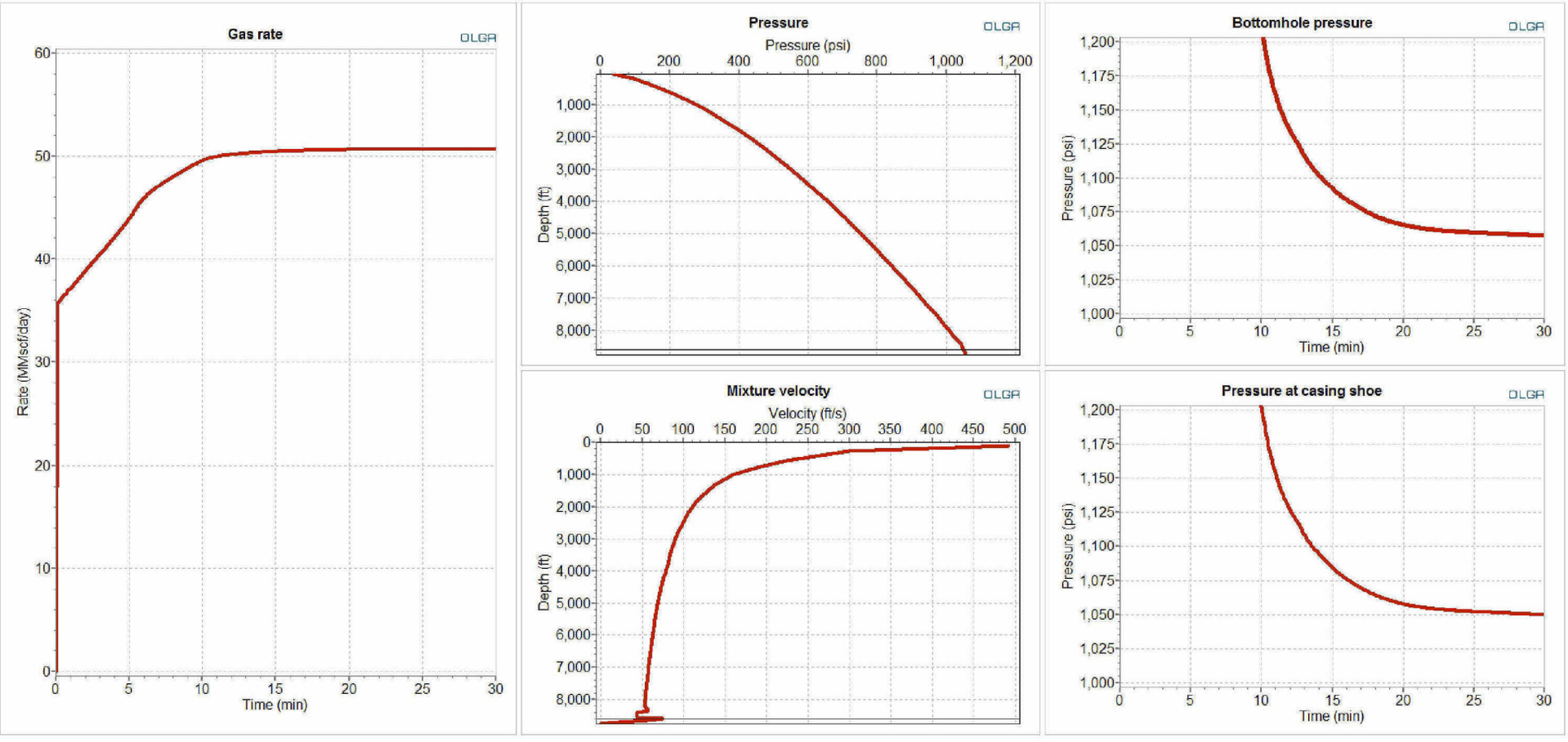
4 SNAPSHOTS



Wellbore condition during blowout from Porter 39A. The gas blowout rate is 50 MMscfd. The flowing bottomhole pressure is 3,830 psi. The pressure at the last casing shoe is 1,060, psi.

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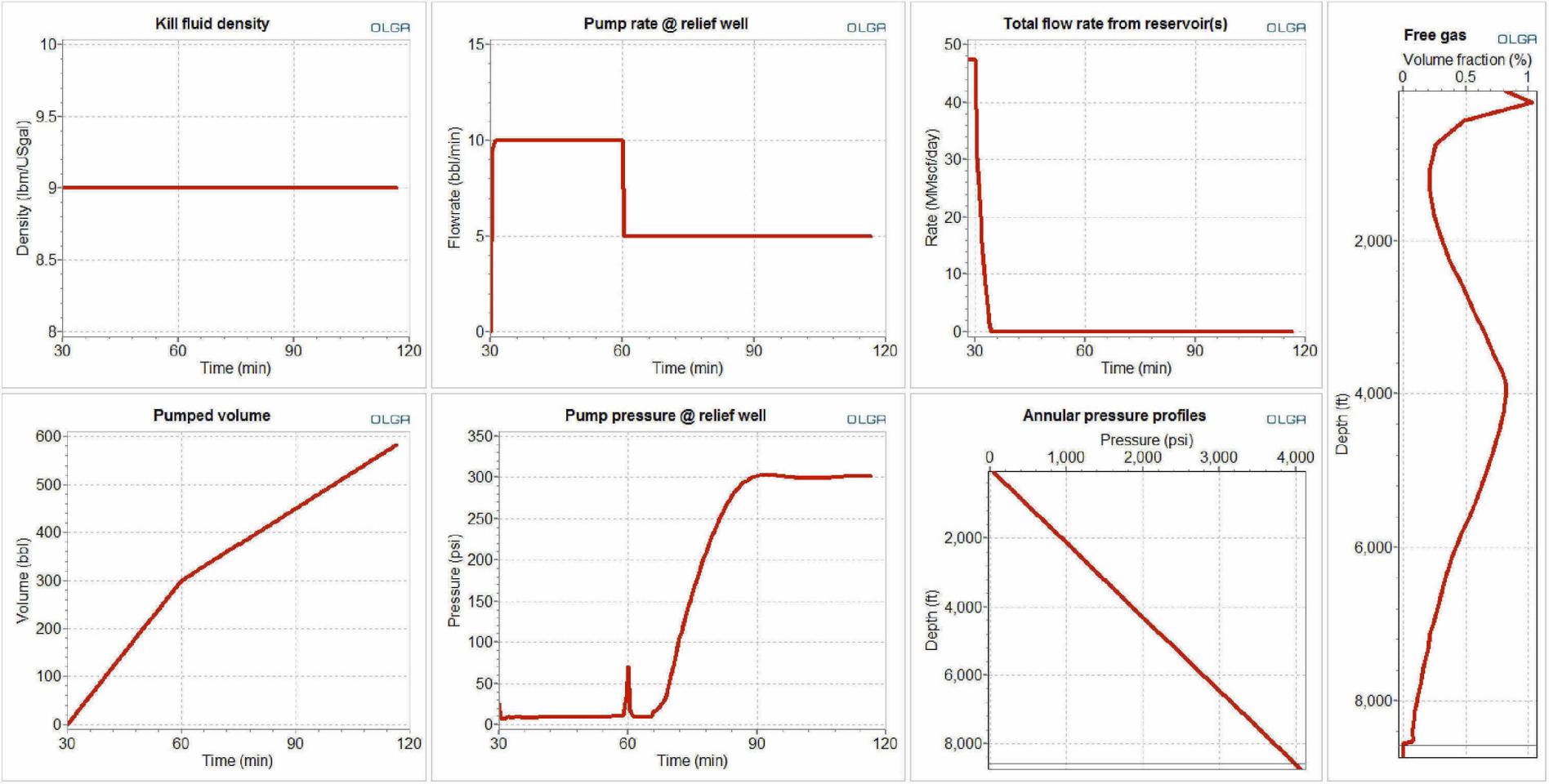

The influx stops after pumping 150 bbls of 9.0 ppg kill fluid enters the target well. The fluid from the relief well u-tubes into the target well. Minimum 580 bbls of kill fluid is required to perform dynamic kill analysis. The maximum pump pressure is 300 psi at the rate of 5 bpm

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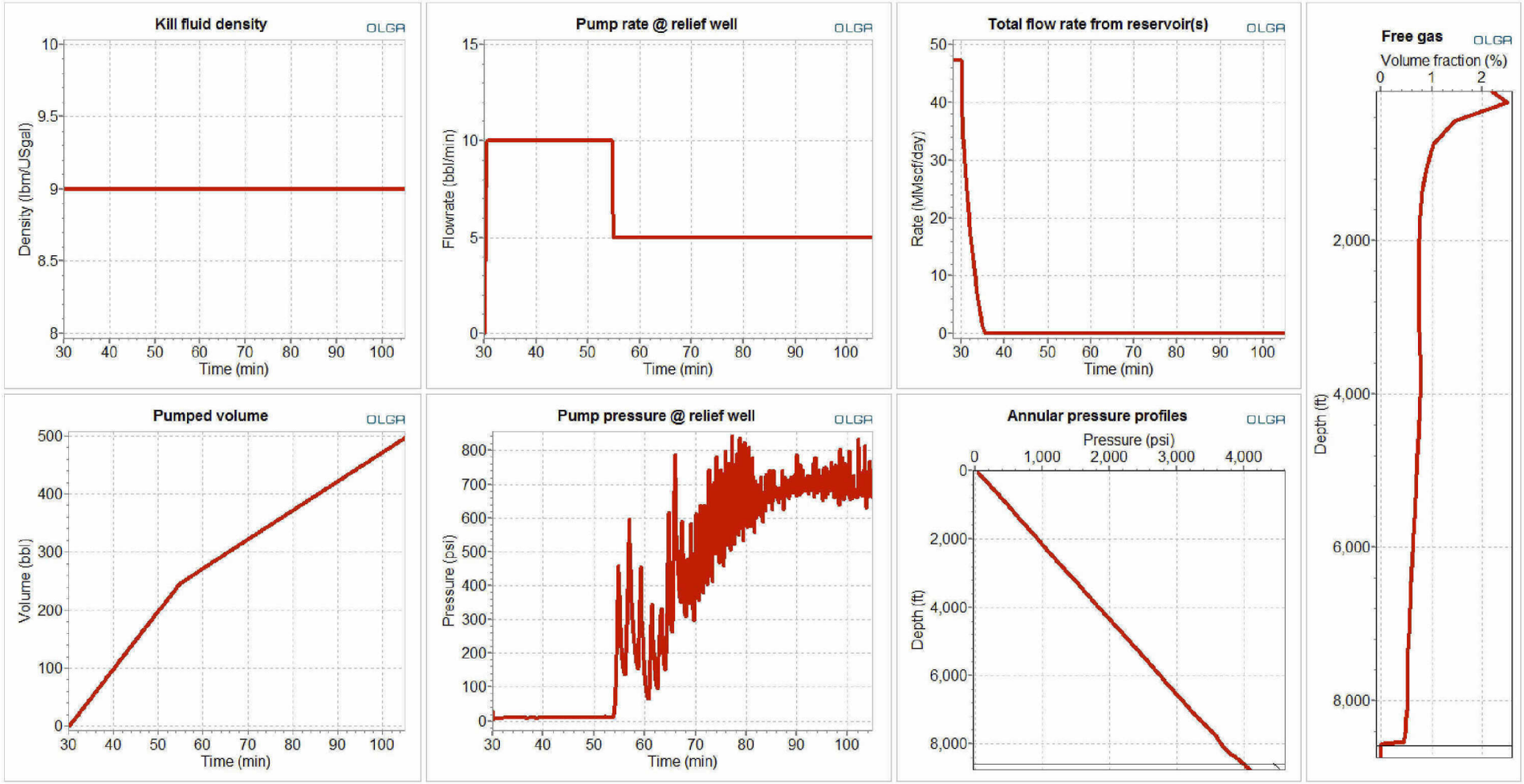

The influx stops after pumping 100 bbls of 9.0 ppg kill fluid enters the target well. The fluid from the relief well u-tubes into the target well. Minimum 500 bbls of kill fluid is required to perform dynamic kill analysis. The maximum pump pressure is 800 psi at the rate of 5 bpm.

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GAS STANDARD

FIELD PROCEDURE – EMERGENCY INCIDENTS – UNDERGROUND STORAGE WELLS	SOCALGAS: 183.0080

PURPOSE **This Company Procedure provides guidelines for prioritizing these well emergencies and responding to them. Annual meetings are held with field personnel to review the contents of this procedure and the related well emergency job instructions for each field. Surface and subsurface well problems in underground storage fields may occur at any time. Depending on the severity of the problem, a well emergency may exist.**

1. FACTORS IN DETERMINING ACTION

1.1. The appropriate response and reaction plan to an emergency well incident depends on the type of emergency and whether there is an immediate or potential threat to lives and property. It is important that those persons responsible for responding to well emergencies are able to quickly assess the extent of the problem and clearly understand what must be done. An emergency plan for storage field wells is available in the main office at each facility in a location designated by the Storage Field Engineer. The plan clearly defines organization relationships and responsibilities. The plan states who is responsible for performing specific duties and who has decision-making authority for specific actions in the plan.

In addition to the type and severity of the well emergency, the following are considered:

1.2. **Public safety** is the primary concern. Hazardous areas and buildings are evacuated, and the public is restricted from them. Proper liaison with the fire and police departments is essential for the protection of the public.

1.3. **Employee safety** is of major concern to the Company. As with normal work conditions, all work is performed with maximum regard for safety.

1.4. **Protection of property** is second only to the safety of the public and employees. It is essential that all sources of ignition be eliminated for prevention of fires and explosions.

1.5. **Inconvenience to the public** is also important. Depending on the location and severity of the problem, the well emergency may or may not be an inconvenience to the public. When possible and practical, every effort is made to reduce or eliminate any inconvenience caused the public as a result of an emergency well incident.

1.6. **Relative costs** are important factors but not sufficient reason to risk any endangerment to employees or the public.

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2. TYPES OF WELL EMERGENCIES

Well emergencies are identified and prioritized on the basis of severity and the potential danger to lives and property.

2.1. **Priority 1 Emergency**

Loss of well control (i.e., uncontrolled flow of fluids from a well or wells) which may result or has resulted in a fire, explosion, or other hazardous situation. This type of incident is an immediate threat to the public, employee safety and/or property. Typical causes of this type of emergency are:

2.1.1. Failure of wellhead equipment.

2.1.2. Internal erosion or corrosion of piping or wellhead equipment caused by sand and/or reservoir fluids.

2.1.3. Damage to piping and/or well equipment by earthquakes, landslides, hydrates, sabotage, or accidents.

2.1.4. Severe shallow casing leak in a well.

2.1.5. Emergencies such as the unintentional release of hazardous substances may pose a threat to people and/or the environment for proper guidance contact the Storage Environmental and/or Safety Representative.

2.2. **Priority 2 Emergency**

Major gas migration incidents where the location or dispersion of the gaseous emission minimize immediate hazards. This situation is normally detected by increased pressure and/or production from collection or observation wells or by abnormal surface gas emissions. This type of incident requires immediate attention with the realization that it could develop into a Priority 1 emergency if not remedied promptly. Typical causes of this type of problem are:

2.2.1. Water-shut-off (WSO) or casing shoe leaks in storage wells.

2.2.2. Casing failure or casing leak in casing flow gas well.

2.2.3. Damage to well by earthquake, fault movement or landslide.

2.2.4. Stabilized reservoir pressure that exceeds established limits.

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2.2.5. Excessive gas pressure in the surface casing annulus of a well.

3. APPROPRIATE ACTION

3.1. The following is a summary of the actions taken, as appropriate, by the first Company management employee at the site of any well emergency. Notification of responsible personnel is made as soon as possible after primary safety concerns are met.

3.1.1. Determine area limits of escaping gas and whether hydrogen sulfide contamination or release of any other hazardous substance is suspected.

3.1.2. If ignition has not occurred, determine if ignition is a possibility.

3.1.3. Evacuate from and restrict entry into hazardous areas, particularly buildings, if the concentration of gas indicates ignition is a possibility.

3.1.4. Eliminate sources of ignition.

3.1.5. When appropriate, establish communications with fire and/or police departments on the scene as soon as possible (refer to document **STANDARD 183.0030** *Contact with Fire and Police Departments and Public Agencies).*

3.1.6. Responses to news media inquiries during emergency incidents are made in accordance with document **STANDARD 183.55**, *Responding to News Media During Emergency Incidents*.

3.2. Prioritize the emergency according to the guidelines given in Section 2 of this Company Procedure.

3.3. After determining the priority level, follow the appropriate action plan. When required, on-call personnel are contacted.

Action Plan — Priority 1

3.4. Immediately notify station representative on duty.

3.5. Immediately notify Operations Control and apprise them of current situation.

3.6. Immediately notify Storage Field Engineer.

3.7. The station representative notifies senior Storage Management.

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3.8. Storage Management notifies the responsible Environmental Representative.

3.9. The Storage Field Engineer notifies Storage Engineering.

3.10. Operations Control notifies the Senior Storage On-Call Manager. The Senior Storage On-Call Manager decides whether to notify the Message Center in accordance with document **STANDARD 183.05,** *Reports to the Message Center*. In addition, Operations Control notifies the Senior Storage On-Call Manager when the Emergency Response Center is opened.

3.11. The Storage Field Engineer, station personnel and Storage Engineering personnel develop an action plan to control the well(s).

3.12. The Storage Engineering Manager is responsible for the overall action plan to gain control of a well during a Priority 1 emergency.

3.13. When appropriate, early consideration is given to contacting experts in the handling of out-of-control wells. The Storage Engineering Manager or the Storage On-Call Manager is responsible for authorizing this contact.

Action Plan — Priority 2

3.14. Immediately notify the Storage Field Engineer who in turn notifies the Storage Engineering Manager.

3.15. Immediately notify station representatives.

3.16. The station representative notifies the senior Storage management representative.

3.17. The Storage Field Engineer, Storage Engineering Staff and station representatives develop the action plan to locate and control the well leak(s). The plan may include but is not limited to the following:

- Contact service companies used for well kill operations and arrange to have necessary equipment brought to the field immediately.
- Contact the Engineering Analysis Center and request the lab truck at the site as soon as possible.
- Arrange for additional wireline trucks from designated contractors (see section 4, paragraph 4.2.).
- Check well surface pressures and note any abnormal conditions.
- Vent excess surface casing pressures.

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- Begin running temperature surveys as necessary to identify leaking well.
- Have production-logging trucks available on site to run noise logs in wells suspected of leaking.
- Perform bar-hole leakage surveys around all active and abandoned wells with in 600 feet of a suspected leak and note any irregularities.
- Once leakage source(s) is (are) determined, proceed immediately with efforts to control the leakage.
- Continue accelerated monitoring procedures to determine if source of leakage has been effectively controlled.

4. EMERGENCY PLANS FOR WELL EMERGENCIES

Before a well emergency incident occurs, it is important that effective emergency plans are established by each storage facility and fully understood by all parties involved. The plan defines the responsibilities for the tasks involved and indicates who has decision-making authority for specific actions in the plan. The emergency plans include the following information:

4.1. Who to notify if a well emergency occurs (see Section 3 of this document).

4.2. A list of contractors, service companies, and telephone numbers to call for equipment and materials necessary for well kill operations, such as:

4.2.1. Well kill fluid.

4.2.2. Pump trucks.

4.2.3. Vacuum trucks.

4.2.4. Tanks for storage of kill fluid.

4.2.5. Wire Line Survey contractors (including temperature/noise logging equipment).

4.1. A geologic structure map for the field showing the surface and bottomhole locations for all wells and the wellbore directional path.

4.2. For each well site, a plot plan showing:

4.2.1. Well location.

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4.2.2. Where the tanks and pumping equipment are placed.

4.2.3. A diagram showing the location of the kill piping, valve location, connection size and type, and particularly the location of all surface safety valves.

4.3. For each well:

4.3.1. A current well mechanical diagram showing all information pertinent to the well's current condition and the capacities of tubing and casing.

4.3.2. A diagram of wellhead showing all operating valves, their positions, sizes and pressure ratings.

4.3.3. A normal well kill plan (see Document **STANDARD 224.045**, *Routine Well Kills)*.

4.4. A diagram showing the location of all emergency equipment such as: fire extinguishers, fire hydrants, shovels, etc.

4.5. A piping diagram showing the entire kill system for the field.

5. REPORTING OF WELL INCIDENTS

The requirements of document **183.05**, *Reports to the Message Center,* are met if applicable.

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GAS STANDARD

FIELD PROCEDURE – EMERGENCY INCIDENTS – UNDERGROUND STORAGE WELLS	SOCALGAS: 183.0080

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Part of SoCalGas O&M Plan:	No
Part of SDG&E O&M Plan:	No
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Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

PURPOSE: **Provide direction in killing a gas storage well in a routine situation.**

1. PLANNING

1.1. Prior to killing the well, review the well file and discuss kill with the **Storage Field Engineer** to ensure that a means of pressure communication exists between the tubing and tubing/casing annulus. Schedule any required wireline work prior to well killing operations.

1.2. Contact and inform the proper **Station personnel** of the scheduled time for the kill. This will allow the **Station personnel** to schedule any necessary piping modifications and to make arrangements for the displaced gas.

1.3. If necessary, make arrangements to have a portable tank moved to the well site, Allow sufficient time to place the tank and install return line prior to the kill.

1.4. Make arrangements with a drilling fluids company and vacuum truck service to have the kill fluid mixed and delivered prior to the kill.

1.5. Make arrangements to have portable radios available for communication when the valve that is used to control gas flow from the well is more than 100 feet from the wellhead.

2. PREPARATION (Guideline)

2.1. Portable Tank Installation

Move a portable liquids storage tank to the well site. If a workover rig will be moved onto the well after it is killed, consult with **drilling representatives** for proper placement of tank.

2.2. Piping Modifications

If piping modifications are required:

2.2.1. Install choke valve and return line at remote casing kill valve and bleed gas pressure off casing according to region job instructions. The casing kill lateral must remain in place until well is killed.

2.2.2. Check the manufacturer's instructions to ensure correct installation of the choke valve. On some wells the choke valve can be installed on the casing withdrawal line, but flow through the casing withdrawal line must not be restricted. There must be a valve in the withdrawal line downstream from the choke that can be closed to isolate the wellhead.

2.2.3. Run a two-inch return line from the choke valve to the portable tank.

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2.2.4. Install gauges to measure the tubing and casing wellhead pressures.

2.2.5. Grease all valves that will be affected by the kill operation. Be sure they operate properly and do not leak.

2.3. Kill Fluid

2.3.1. The kill fluid is mixed and hauled to the well site prior to killing the well. The quantity of kill fluid delivered to the well must be at least 120% of the well volume.

2.3.2. The kill fluid should be filtered whenever possible.

2.3.3. The viscous pill is delivered to the site just before the kill begins. The pill volume must be at least the volume of the well below the circulating depth plus ten barrels, but not more than the volume of the well below the circulating depth plus tubing volume plus ten barrels.

3. WELL KILL USING CONSTANT TUBING PRESSURE METHOD

3.1. Where a pump truck is used, rig up the line from pump discharge to the wellhead with a block valve that is convenient to operate. The line can be rigged up to either the Unibolt or the tubing kill valve.

3.1.1. Calibrate zero point on pressure recorder.

3.1.2. Test pumps and lines to 500 psi above wellhead pressure against the temporary block valve for 15 minutes.

3.1.3. Calibrate pressure recorder with pressure gauge at test pressure.

3.1.4. Bleed off pressure and re-calibrate zero point on pressure recorder.

3.2. Record original shut in casing pressure (OSICP). Connect vacuum truck containing viscous pill to pump intake. With casing shut in, pump viscous pill at two barrels per minute.

3.2.1. After viscous pill is pumped, shut down the pump.

3.2.2. Disconnect pump intake line from vacuum truck and connect to tank containing kill fluid.

3.2.3. If the viscous pill is not of sufficient volume to fill the volume of the well below the circulating depth and the tubing volume, pump enough kill fluid to fill the tubing to the surface.

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3.2.4. Close the master valve. Leave all valves closed for 45 minutes to one hour, or as determined by the **Storage Field Engineer**, to allow the viscous pill to fill pore space adjacent to the wellbore.

3.3. Open master valve and pump kill fluid at a constant rate. Allow casing pressure to increase to 50-75 psi above OSICP. Open the remote casing withdrawal valve just enough to maintain this pressure. If casing pressure does not start to increase after 20 barrels of kill fluid is pumped, stop pumping and shut-in well for 30 - 45 minutes to allow the formation to "heal," then attempt it again.

3.4. During the first portion of the kill with casing pressure 50 - 75 psi above OSICP, tubing pressure should be zero.

3.4.1. As the fluid level in the annulus increases, tubing pressure will increase.

3.4.2. When tubing pressure reaches a pressure P as defined below, disregard casing pressure and manipulate the remote casing withdrawal valve to maintain tubing pressure at P.

3.4.3. P is calculated using Equation 1. P represents the pressure drop in the tubing assuming an average value for density and viscosity of the fluid and friction factor in the tubing.

$$P = \frac{L * Q^2}{2 * D^5} \qquad \text{Equation 1}$$

where:

P = tubing pressure (psig)

L = measured depth of tubing (feet)

D = internal diameter of tubing (inches)

Q = pump rate (barrels per minute)

3.5. Continue pumping at a constant rate while maintaining tubing pressure at P until casing pressure is down to withdrawal line pressure. Record total volume pumped and casing pressure at this time.

3.5.1. Close the operating withdrawal valve and flow gas through the return line to the portable tank, still maintaining tubing pressure at P by manipulating the temporary choke valve. It may be necessary to reduce the pump rate to have a tolerable flow rate at the portable tank.

3.5.2. When fluid returns are obtained, record the total volume pumped and circulate at least 10% of the well volume to ensure no gas cut mud is present.

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3.6. If the fluid returns are gas cut, continue circulating but keep the flow choked back so that tubing pressure does not drop below P. Where returns are going into the same tank that the pump intake is pulling from, monitor the fluid before it reaches the pump intake. Stop pumping when gas cut fluid reaches the pump intake and shut the well in.

3.6.1. When it is not urgent that the well be completely dead, wait until the gas comes out of solution from the fluid in the tank. This may take a day or more depending on the volume and viscosity of the fluid.

3.6.2. If the well must be dead as soon as possible, it will be necessary to bring fresh fluid to continue circulating.

3.6.3. In either case, when pumping commences again, there will be a gas bubble in the annulus. Do not blow this gas down quickly, as this will allow more gas entry from the formation. Choke the flow while pumping to maintain tubing pressure at P.

3.7. It is necessary to estimate the quantity of gas vented to the atmosphere. If casing pressure is between 400 psi and 800 psi when venting to the atmosphere begins, use Equation 2 to estimate the quantity of gas. If casing pressure is outside this range, the Storage Field Engineer should be asked to determine the quantity of gas.

$$V = \frac{Pc(V_2 - V_1)}{2800} \qquad \text{Equation 2}$$

where:

V	=	volume of gas vented to atmosphere (MCF at standard conditions)
Pc	=	casing pressure at the moment when venting to the atmosphere begins (psi)
V_2	=	total volume of fluid pumped at the moment fluid returns are obtained, including volume of pill (barrels)
V_1	=	total volume of fluid pumped at the moment venting to the atmosphere begins, including pill (barrels)

Report the volume of gas vented to the atmosphere to appropriate **Station personnel**.

4. WELL KILL USING SCHEDULE METHOD

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4.1. The schedule method assumes that as the liquid is pumped down the tubing or casing an equivalent head of fluid is being displaced out the other side and a constant bottom hole pressure is maintained.

4.2. The schedule method does not consider any fluid lost to the formation and does not give any direct surface indication of bottom hole pressure. Accurate volume measurement of the fluid being pumped is essential.

4.3. Where a pump truck is used, rig up the line from pump discharge to the wellhead with a block valve conveniently located for ease of operation. The line can be rigged up to either the Unibolt, tubing kill valve, or casing kill valve dependent upon the type of kill (tubing, casing).

4.3.1. Calibrate zero point on pressure recorder.

4.3.2. Test pumps and lines to 500 psi above wellhead pressure against the temporary block valve for 15 minutes.

4.3.3. Calibrate pressure recorder with pressure gauge at test pressure.

4.3.4. Bleed off pressure and re-calibrate zero point on pressure recorder.

4.4. Record original shut-in casing pressure (OSICP). Connect vacuum truck containing viscous pill to pump intake. With casing shut-in, pump viscous pill at two barrels per minute.

4.4.1. If the viscous pill volume is less than the volume to fill the well below the circulating depth and the tubing, pump enough kill fluid to fill the tubing to the surface.

4.4.2. Close the master valve. Leave all valves closed for 45 minutes to one hour, or as determined by the **Storage Field Engineer**, to allow the viscous pill to fill pore space adjacent to the wellbore.

4.5. Kill Schedule Calculation Procedures

4.5.1. Determine total volume to fill tubing and casing above circulating depth.

4.5.2. Determine wellhead pressure assuming tubing and casing both are filled with gas above the pill (assume top of pill is liner top).

4.5.3. Prepare a kill schedule following the example in Table A.

4.5.4. Open master valve and pump kill fluid at a constant rate of approximately 3 bpm. Allow casing/tubing pressure, whichever is used for returns, to increase approximately 50 psi above OSIP; or, after 20 barrels of kill fluid have been

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pumped, open the return line valve just enough to allow a pressure decrease equivalent to the volume of liquids pumped (see kill schedule). If return line pressure does not increase after pumping 20 barrels of kill fluid, stop pumping and close all valves for 30 minutes to allow the formation to "heal," then repeat the procedure. Pressure on the pump side will fall to zero shortly after pumping begins (a volume of 30 - 40 barrels) and remain at zero until returns arrive.

4.6. Continue pumping until return line pressure is down to withdrawal line pressure. Record total volume pumped and return line pressure at this time.

4.6.1. Close the operating withdrawal valve and flow gas through the return line to the portable tank. It may be necessary to reduce the pump rate to have a tolerable flow rate at the portable tank.

4.6.2. When fluid returns are obtained, record the total volume pumped and continue circulating at least 10% of the well volume to ensure no gas cut mud is present.

4.7. If the fluid returns are gas cut, continue circulating until fluid is gas free. Where returns are going into the same tank that the pump intake is pulling from, monitor the fluid before it reaches the pump intake. Stop pumping when gas cut fluid reaches the pump intake and close the well in.

4.7.1. When it is not urgent that the well be completely dead, wait until the gas comes out of solution from the fluid in the tank. This may take a day or more depending on the volume and viscosity of the fluid.

4.7.2. If the well must be dead as soon as possible, it will be necessary to bring fresh fluid to continue circulating.

4.7.3. In either case, when pumping commences again, there will be a gas bubble in the annulus. Do not blow this gas down quickly, as this will allow more gas entry from the formation. Choke the flow while pumping to maintain tubing pressure at P.

4.8. It is necessary to estimate the quantity of gas vented to the atmosphere. If casing pressure is between 400 psi and 800 psi when venting to the atmosphere begins, use Equation 2 to estimate the quantity of gas. If casing pressure is outside this range, the **Storage Field Engineer** should determine the quantity of gas.

$$V = \frac{Pc(V_2 - V_1)}{2800} \qquad \text{Equation 2}$$

where:

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V = volume of gas vented to atmosphere (MCF at standard conditions)

Pc = casing pressure at the moment when venting to the atmosphere begins (psi)

V_2 = total volume of fluid pumped at the moment fluid returns are obtained, including volume of pill (barrels)

V_1 = total volume of fluid pumped at the moment venting to the atmosphere begins, including pill (barrels)

Report the volume of gas vented to the atmosphere to the Station.

TABLE A
Example Well Kill Schedule

SIWHP = 1500 PSIG

Total Well Capacity = 200 Bbls.

$$\frac{(1500+50)\text{psi}}{(200-20)\text{bbl}} = 8.61 \text{ psi/bbl}$$

Therefore, bleed off approximately 8.61 psi of pressure for each barrel of kill fluid pumped. The returns should arrive at surface when wellhead pressure reads zero (psig).

SIWHP (PSIG)	LIQUID PUMPED * (BBLS)
1500	0
1500	20
1378	40
1205	60
1034	80
862	100
690	120
518	140
346	160
174	180
0	200

*Pumping at approximately 3 bbl/min

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5. Circulating Fluid with a Wireline Plug Installed in the Tubing (No-Go) Profile Nipple

5.1. Install gauges on the tubing and casing. Set a wireline plug in the profile nipple below the sliding sleeve. Open the sliding sleeve. Reduce the tubing pressure by 200 psi. If the casing pressure also falls, the sleeve is verified open and communication between tubing and casing has been established.

5.2. Calculate the well volume above the wireline plug and packer and record the equalized wellhead pressure.

5.3. Block both surface safety valves open and remove the high pressure pilot, low pressure pilot and sacrificial probes etc. and lateral piping. Install temporary piping on either the kill or injection lateral and connect it to a tubing and a casing wellhead valve. Install temporary piping on the opposite tubing and casing wellhead valves and route them to the inlet of a portable separator. Connect the "Gas Out" of the separator through an adjustable choke to the withdrawal piping and the "Liquid Out" of the separator to an empty fluid tank.

5.4. The goal of this method is to replace gas pressure with hydrostatic head. It is important to keep differential pressure across the wireline plug constant while circulating gas out of the well. This is done by dividing the wellhead pressure (psi) and calculated fluid volume by 20, then pump fluid and reduce gas pressure in equal increments. Gas is flowed from the casing through the separator to the withdrawal line while fluid is pumped into the tubing until fluid returns on the casing is achieved.

Refer to the example below:

Pressure	Volume
2250	50
2137.5	75
2025	100
1912.5	125
1800	150
1687.5	175
1575	200
1462.5	225
1350	250
1237.5	275
1125	300
1012.5	325
900	350
787.5	375

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675	400
562.5	425
450	450
337.5	475
225	500

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Company Operations Standard

Well Operations - Well Kill	SCG:	224.0030

PURPOSE **A well kill may be required to perform workover operations, to stop gas loss due to a casing, wellhead, or shoe leak, or to perform wireline or wellhead work that cannot be performed otherwise.**

1. POLICY

1.1. The **Storage Field Engineer** is responsible for well kills. Responsibility may be delegated to certain other **Company** personnel in some circumstances. The person in charge, in accordance with pre-arranged kill plans immediately handles emergency kill jobs. The **Storage Operations Manager** and **Storage Engineering Manager** are informed of such incidents as soon as practical.

2. RESPONSIBILITIES & QUALIFICATIONS

2.1. FACILITIES OPERATIONS

2.1.1. Storage Field personnel operate all surface valves. On routine kills, notify the **Storage Field Engineer** at least two days prior to killing the well to allow time for piping modifications and to make arrangements to accept the displaced gas through the withdrawal system.

3. DEFINITIONS

3.1. Not Applicable

4. PROCEDURE

4.1. OVERVIEW

4.1.1. This document provides guidelines for routine, planned kill jobs. Emergency kills that are performed because of unplanned conditions that may result in uncontrolled discharge of gas require special procedures for each case. Special kill plans for emergency conditions are prepared by **Storage Engineering.**

4.1.2. Killing a well involves circulating a fluid into the well that provides a higher hydrostatic pressure than the reservoir gas pressure, effectively resulting in zero pressure at the surface.

4.2. FLUID

4.2.1. The fluid used to kill a well must be of sufficient density to provide a 200 to 500 psi overbalance over the reservoir pressure and viscous enough to prevent excessive fluid loss to the formation.

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4.2.1.1. The fluid must be designed to minimize formation damage. This requires low solids content to prevent pore plugging.

4.2.1.2. The fluid must have high enough salinity to prevent swelling and dispersion of formation clays.

4.2.1.3. The best fluid to use is formation water produced from the zone to be killed if it has high enough density to provide the 200 to 500 psi overbalance. When a higher density is required, use KCI or CaCl2 water to the needed density. The KCI or CaCl2 will generally prevent clay swelling or dispersion even at low concentrations. See **STANDARD 224.05**, *Blowout Prevention Equipment Configuration, Installation, Testing and Operation*, for the method of calculating the required fluid density.

4.2.1.4. A viscous pill may sometimes be used when killing a well to prevent excessive fluid loss to the formation. However, at Aliso Canyon and Honor Rancho when the reservoir is at high inventory, a viscous pill may not be necessary. Adequate viscosity for a pill can be obtained by mixing two pounds of HEC polymer per barrel of fluid. The remainder of the kill fluid should be viscosified by adding 1.0 pounds of HEC per barrel of fluid. The kill fluid should also contain biocide, corrosion inhibitor, oxygen scavenger and foam retardant in amounts recommended by the Storage Engineering Department.

4.2.1.5. Do not use a HEC viscous pill at the Playa Del Rey field because stubborn emulsion problems will develop. Kill fluid at Playa Del Rey should also contain 3% Misol or A-Sol G15 by volume to minimize emulsion formation. Misol is currently available from MTS Stimulation Services and is the preferred chemical. A-Sol G15 is a Welchem product available from BJ Services.

4.3. EQUIPMENT (Figure 1)

4.3.1. Pump

4.3.1.1. The pump used to kill the well must be capable of pumping against the shut-in wellhead pressure plus 500 psi. It should be capable of at least a three-barrel-per minute rate at the highest wellhead pressure. The pump should be equipped with a calibrated pressure recorder.

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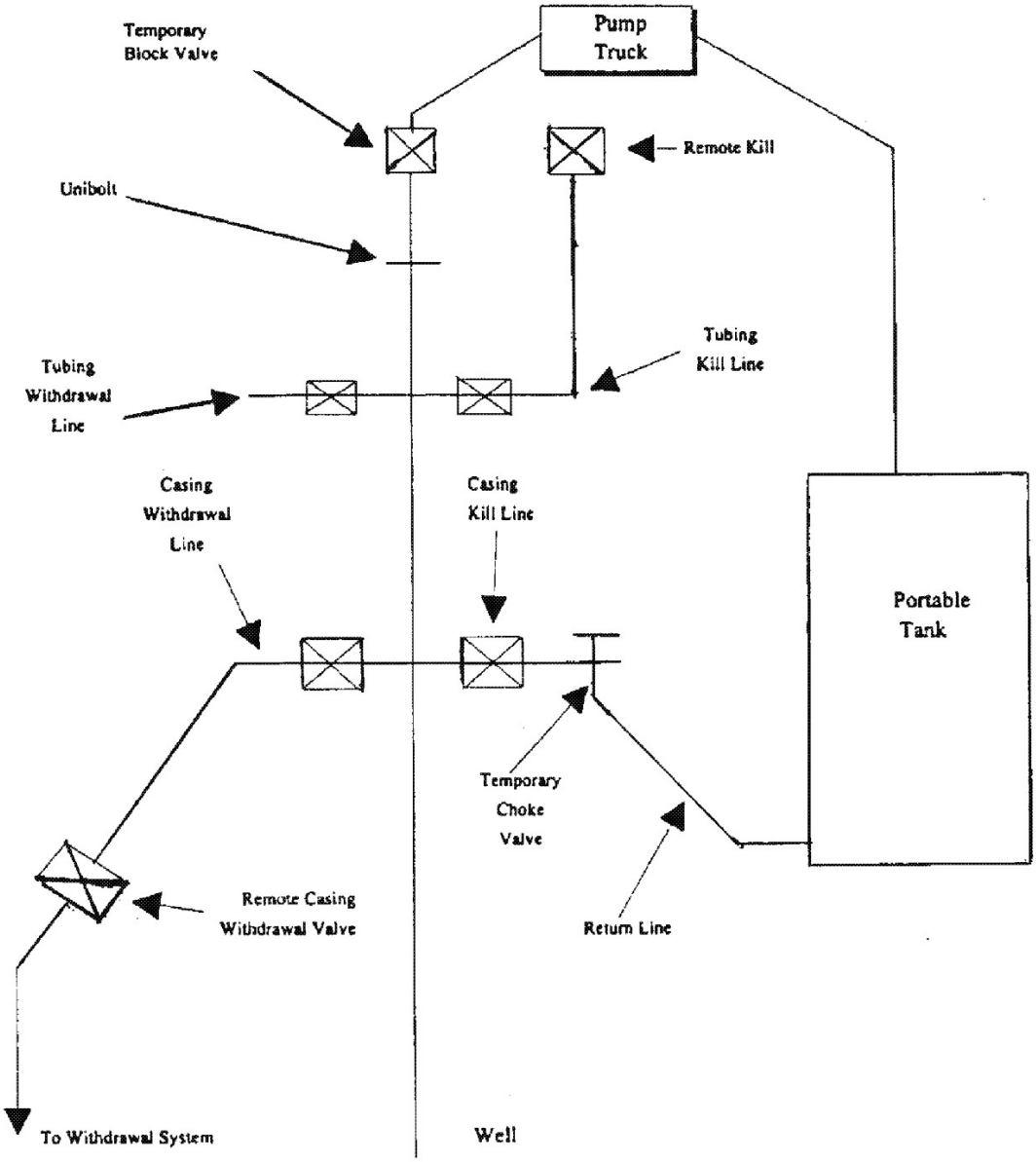

FIGURE 1
TYPICAL PIPING SCHEMATIC

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4.3.2. Lines and Valves

4.3.2.1. When a pump truck is used to kill the well, all lines from the pump truck to the wellhead must be at least 5,000 psi pressure rating. Install a valve of at least 5,000 psi pressure rating between the line from the pump truck and the wellhead or remote kill valve.

4.3.2.2. The well may also be killed through the Company kill line.

4.3.2.3. Install choke valve of at least 5,000 psi pressure rating on the casing kill side or other suitable location that will allow casing pressure to be bled down to atmosphere without having the low pressure sensor prevent flow by closing the surface safety valve.

4.3.2.4. A return line of at least 1,000 psi pressure rating is installed between the choke valve and the tank used to hold fluid returns.

4.3.3. All components between the wellhead and the choke valve must have a pressure rating that is equivalent to or exceeds that of the wellhead.

4.4. PROCEDURES

4.4.1. The preparations and kill operations are carried out in accordance with **STANDARD 224.045**, *Routine Well Kills*.

5. RECORDS

5.1. Record the pressure during a kill operation on a pressure chart.

5.1.1. Measure and record the total volume of fluid used.

5.1.2. The volume of gas vented to atmosphere is estimated and reported to the Storage Field Engineer.

5.2. If the well is killed by a **Rig Supervisor**, attach these records to the Daily Activity Report. If the well is killed by someone other than a **Rig Supervisor**, retain these records in the field well file.

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Company Operations Standard

Well Operations - Well Kill	SCG:	224.0030

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Company Operations Standard

Blowout Prevention Equipment Configuration, Installation, Testing and Operation	SCG:	224.05

PURPOSE **To ensure that effective blowout prevention equipment and practices are used during drilling and workover operations.**

1. POLICY

1.1. This document sets the mandatory Company responsibilities and requirements with respect to the appropriate configuration, installation and testing of blowout prevention equipment (BOPE) used during drilling and workover operations. BOPE requirements are mandated by the California Division of Oil, Gas and Geothermal Resources (D.O.G.G.R.) regulations (Title 14) and referenced in the DOGGR manual ***Blowout Prevention in California***. All Rig Supervisors and Storage Field Engineers are to be familiar with this Company Gas Standard.

1.2. Primary well control is achieved during drilling and workover operations by maintaining a hydrostatic pressure in the wellbore that exceeds reservoir pressure. Adequate hydrostatic pressure is achieved through the proper design of drilling and workover fluid as well as through operational procedures to ensure that a sufficient column of fluid exists in the well at all times. Adequate and fail safe functioning blowout prevention equipment must be maintained in the event of loss of primary well control which has the potential to occur at any time during operations. Rig personnel must be familiar with safe operating practices and fully trained to operate the BOPE if necessary.

1.3. A copy of the D.O.G.G.R. manual ***Blowout Prevention in California*** shall be on location for reference whenever BOPE equipment is in use.

2. RESPONSIBILITIES

2.1. Storage Engineering Manager

2.1.1. The Storage Engineering Manager is responsible for supervising and advising Storage Field Engineers.

2.2. Storage Field Engineers

2.2.1. The Storage Field Engineers are responsible for preparing detailed work programs based on evaluation of known or anticipated conditions. They design and recommend to the Storage Engineering Manager all equipment, materials and procedures used.

2.2.2. Supervising and advising Rig Supervisors.

2.2.3. Keeping the Storage Engineering Manager informed of operations and obtaining approvals of practices that deviate from this procedure.

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2.3. Rig Supervisor

2.3.1. The Rig Supervisor is responsible for planning and supervising the work outlined in the well program.

2.3.2. Ensuring that all work is performed safely in accordance with established Company guidelines and industry standards.

2.3.3. Ensuring that blowout prevention equipment is properly installed, inspected, tested and operated at all times.

2.3.4. Ensuring that rig crews are adequately trained to control the well at all times, including detection and proper response to well kicks and maintenance of proper fluid columns.

2.3.5. Keeping the Storage Field Engineer informed of potential hazards or operational difficulties and assisting as necessary in resolving such situations.

2.3.6. Seeking advice and counsel from the Storage Field Engineers, Storage Engineering Manager, other Rig Supervisors or staff personnel.

3. WELL CLASSIFICATION

3.1. STORAGE ZONE WELLS

3.1.1. BOPE classification of wells planned for drilling or workover operations in the storage zone are based on selection guidelines from the DOGGR manual ***Blowout Prevention in California (Chapter 2).***

3.1.2. The Storage Engineering Manager may specify additional preventers and/or safety measures, but shall always meet minimum D.O.G.G.R. classification requirements.

3.1.3. The required BOPE classification for workover operations in each storage field is summarized in Table 1. Note that the BOPE classification for each field is based on the maximum pressure for the field even though the well work operations may occur at lower pressure in the range. Reservoir pressure range, well depth range, and gradient are included for reference.

Table 1

Classification of Storage Zone Wells, by Field (Workover Operations)

	Reservoir		Maximum	Well Classification

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Storage Fields	Pressure Range (psig)	Well Depth Range, MD (ft.)	Gradient psi/ft	At Maximum Reservoir Pressure
Aliso Canyon	2000 - 3602	7100 - 9400	0.522	III - 5,000
Honor Rancho	1100 - 4411	9000 - 11000	0.465	III - 5,000
La Goleta	1570 - 2050	3900 - 4300	0.529	III - 3,000
Playa Del Rey	850 - 1710	5800 - 7100	0.465	III - 3,000

3.1.4. Additional Class III BOPE Requirements

3.1.4.1. The choke manifold shall have a minimum of two adjustable chokes and three independently valved outlet lines. See Figure 1 for choke manifold configuration. All fittings on this manifold shall meet or exceed D.O.G.G.R. guidelines for choke manifold components and shall be mounted on a single unit.

3.1.4.2. All hydraulic connections from the actuating unit to the preventer are to be large enough to supply hydraulic fluid rapidly without excessive friction loss, and shall be no less then 1" (nominal) diameter.

3.1.4.3. A complete functional test of the BOPE shall be performed after installation, after partial or complete disassembly and prior to continuing operations potentially dependent upon the functionality of the BOPE. Testing shall be in accordance with field testing requirements set forth in Section 3.6 of this document.

3.1.4.4. Closure checks of the annular preventer may be performed at a reduced closure pressure, typically 700 psi, in order to prevent abnormal wear of the packing material. Following completion of the routine checks, the regulator shall be immediately restored to its normal working pressure, typically 1500 psi. This may only be done provided the hydraulic actuating system has tested satisfactorily at or above the normal working pressure.

3.1.4.5. Two auxiliary pump-in components are needed. One 2" line will be tied into the kill side of the well or lower mud cross and extend

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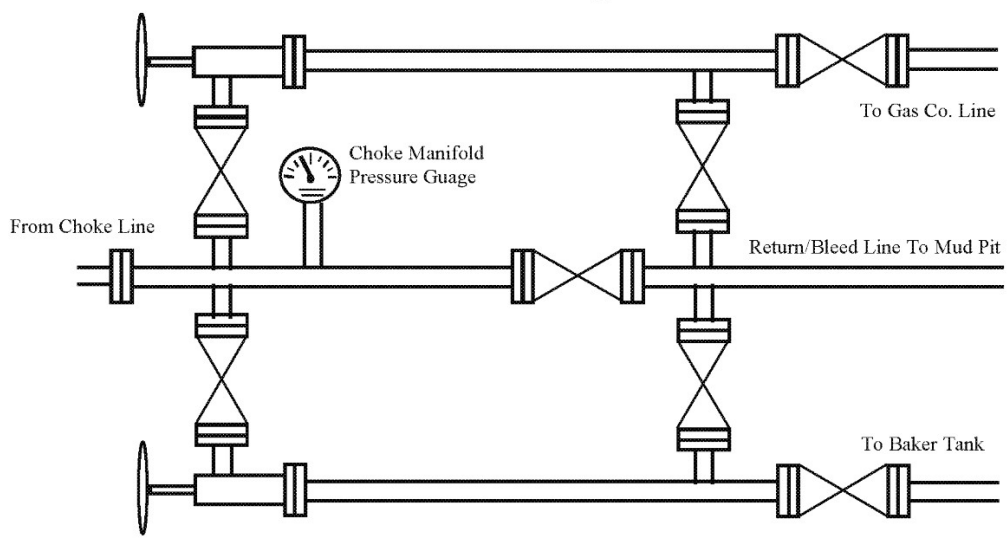
outside the rig substructure where a secondary kill pump such as a cement truck can be connected. This extended kill line will be positioned such that it is not necessary to go under the substructure to operate it. A check valve and a block valve will be installed at the end of this line and all components will be rated to 5000 psi. This line will be staked to the ground to prevent whipping. This block valve will be clearly marked with a sign that states "EMERGENCY KILL". An additional 1" pump in valve will be available on the accumulator where a secondary pressure supply can be connected. This valve will be fitted with a bull plug and clearly marked with a sign that states "AUXILIARY PUMP IN"

3.1.4.6. The DOGGR may require the use of a Class III B BOPE, in the event that drilling operations are planned in the storage zone during workover operations

Figure 1

Choke Manifold Configuration



3.2. NON STORAGE ZONE WELLS

3.2.1. BOPE classification of wells planned for drilling or workover operations in non storage zone wells are based on selection guidelines from the DOGGR manual ***Blowout Prevention in California (Chapter 2).***

3.2.2. Non storage zone wells are defined as existing wells in the storage field that are not drilled through the storage zone. Non storage zone wells have known

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conditions of pressure and not able to sustain production to surface without a form of artificial lift. Wells in the Aliso Canyon shallow zone, Honor Rancho water injection zone, and Montebello oil production zone are defined as non storage zone wells. The required BOPE classification for workover operations in non storage zone wells is Class II 3000 psi.

3.3. ADDITIONAL CLASS II BOPE REQUIREMENTS

3.3.1. For wells or well operations that fall within the D.O.G.G.R. Class II classification requirements, the following additional specific Company provisions shall also apply. Supplementary measures beyond those outlined below may be required or utilized as appropriate.

3.3.2. Additional Class II BOPE Requirements

3.3.2.1. Wells with potential to encounter abnormally high zone pressures.

Where any possibility of encountering an abnormally charged zone or zones exists, BOPE Class II stack arrangement shall minimally consist of an API type "RA" (annular and ram-type preventer combination) arrangement. This includes shallow zone wells where such shallow zone has the potential to have communication with a storage zone through unexpected or unknown leaks.

3.3.2.2. Wells with no potential of encountering abnormally high zone pressures.

Only wells or well operations meeting D.O.G.G.R. Class II BOPE prerequisites that have no potential of encountering abnormally high zone pressures and no potential of encountering zones charged by storage zone leaks shall be eligible for API type "A" arrangement, where the use of a single annular preventer is specified. An example of operations where Class II type "A" arrangements would be permissible is on a shallow zone observation well with known pressures, where casing would not be penetrated into zones of potentially unknown or unexpected pressure.

3.4. FLUIDS

3.4.1. General

Density of the drilling or workover fluid shall be maintained such that a safe over-balance pressure condition exists at all times. A minimum safe over-balance condition is generally defined as 10% greater then the maximum

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possible Bottom Hole Pressure (BHP), but not high enough to cause consistent fluid loss. This minimum over-balance requirement is waived when conditions warrant it, such as during under-balanced drilling or well testing, provided adequate precautions are taken for safe operations under these abnormal conditions and the methodology was set forth in the approved well program.

3.4.2. BHP Determination for Zones of Known Pressure

BHP (or Zone Pressure) for wells in potential communication with a reservoir of known pressure can be determined based on the Shut-in-Well-Head-Pressure (SIWHP) of that well, or a geologically similar well, and then by increasing the SIWHP according to Figure 2 to compensate for the static column of gas in a shut-in well. The BHP is then increased by a minimum 10% safety factor and used for determination of fluid density. Because storage reservoir pressures can change significantly during a drilling or work-over operation, the SIWHP of the well or a geologically similar well shall be checked no less than once per week, and recorded on the daily safety report. The fluid density shall be adjusted as necessary to maintain safe operating conditions.

3.4.3. BHP Determination for Zones of Unknown Pressure

BHP for wells in potential communication with an oil or gas reservoir of unknown pressure shall be determined by multiplying the True Vertical Depth (TVD) by a maximum formation pressure gradient corresponding to the discovery pressure of the field. See reference Table 1 for a Maximum Pressure Gradient for individual fields. A 10% safety factor is then added to determine a minimum safe over-balance pressure and the corresponding fluid density.

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Figure 2
Mud Density Calculation for Gas Wells

Step 1

Find Zone Pressure of a Gas Well:

Zone Pressure = (0.000025 x TVD x SIWHP) + SIWHP

TVD = True vertical depth at top of storage zone

SIWHP = Shut-in wellhead pressure

Step 2

Determine Safety Margin:

Safety Margin = Zone Pressure X 0.10

Under most conditions a safety margin of 10% will be adequate. The safety margin may be set higher at the discretion of the Rig Supervisor and Storage Field Engineer . If the "Calculated Safety Margin" is less than 250 psi and the well has contact with a storage zone, a "Minimum Safety Margin" of 250 psi shall be used. The Safety Margin should not be less than 250 psi unless approved by the Storage Field Manager.

Step 3

Find Working BHP

Working BHP = Zone Pressure + Safety Margin

Working Bottom Hole Pressure is the pressure desired to be exerted by the mud column.

Step 4

Find Desired Minimum Mud Density:

Mud Density (ppg) = 19.25 x Working BHP ÷ TVD

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3.5. BLOWOUT PREVENTION EQUIPMENT

3.5.1. General Requirements

3.5.1.1. The BOPE shall be capable of shutting in and containing the well pressure under all situations to prevent the escape or leakage of fluids from the well.

3.5.1.2. All equipment, including preventers, mud crosses, wellhead equipment, manifolds, lines and valves that may be exposed to wellbore pressure during either normal or well control operations must be of sufficient working pressure rating to contain the maximum anticipated surface pressure.

3.5.1.3. A full opening safety valve is to be located on the rig floor. The valve shall be equipped with a wrench to operate it and all necessary crossovers appropriate to thread into each type of pipe being run, where such pipe can act as a pressure control string or kill string.

3.5.1.4. All chicksan and armored hoses shall be of a minimum 5,000 psi rated working pressure.

3.5.1.5. All BOPE equipment shall meet or exceed D.O.G.G.R. requirements for the classification usage required by the well conditions and as called out in the well program.

3.5.2. Blowout Preventer Installation

3.5.2.1. All BOPE equipment shall be in good working condition meeting or exceeding D.O.G.G.R. requirements and manufacturer's maintenance requirements. BOPE equipment includes, but is not limited to: accumulators, rams, controls, valves, fittings, gauges, manifolds and all hoses and bolts associated with the complete BOPE system.

3.5.2.2. Flanges and all other sealing surfaces are to meet or exceed API 6A requirements. Ring gaskets shall be kept in their boxes until ready for use and shall be stored in a manner to prevent mechanical and/or chemical deterioration.

3.5.2.3. Blowout Preventer Support

Adequately cemented surface casing of strength adequate to support the blowout preventers shall be used for BOPE support as required by D.O.G.G.R. field rules.

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3.5.2.4. Size and Materials

The bore of all preventers, spools and mud crosses is to be of sufficient size to accommodate the largest equipment to be run into the casing below the preventers and must meet or exceed specifications as set forth in American Petroleum Institute (API) Specification No. 6A.

3.5.2.5. Drill Collar Lifting Subs

All drill collar lifting subs used on pipe lowered below the blind rams shall be threaded on top with a standard thread configuration such that the pipe using the lifting sub may be fished or circulated through. This requirement eliminates the use of bails or lifting eyes on lifting subs used in this manner.

3.5.3. Pre Rig-Up Testing and Certification

3.5.3.1. Dimensional and Mechanical Integrity

At the discretion of the Storage Field Engineer, certification of dimensional, hydrostatic or mechanical integrity tests may be required prior to operations. Where pre rig-up hydrostatic pressure testing is performed in lieu of on-site tests, the hydrostatic pressure testing will be accordance with Section 4.6 - TESTING REQUIRMENTS. These tests may also have witness requirements whereby a **Gas Company** employee or representative witnesses the testing and certification process. Testing may also require a complete tear down of the equipment for dimensional and mag-particle inspection of components. All testing or inspection criteria and methodology shall be accordance with D.O.G.G.R., API and equipment manufacturer's recommendations. Where requirements vary, the stricter guideline or requirement shall be adhered to.

3.6. TESTING REQUIREMENTS

3.6.1. General Testing Requirements

3.6.1.1. The goal of field testing is to establish and document that the BOPE can withstand the fluid and gas pressures that may occur during containment of a blowout, and to ensure that equipment utilized by the Gas Company fully complies with California Division of Oil and Gas requirements. All testing procedures are to meet or exceed the requirements of the D.O.G.G.R. as specified in Section 5 of the D.O.G.G.R. publication *Blowout Prevention in California*.

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3.6.1.2. Notification of the D.O.G.G.R. shall be done in accordance with permit requirements and in ample time to have an inspector on location as necessary. When a D.O.G.G.R. representative witnesses a test, the representative will sign the tour sheet in accordance with D.O.G.G.R. requirements and note the witnessed operation in the daily report. If a D.O.G.G.R. representative waives a witnessing requirement, the date and time of the waiver, the nature of the waived witnessing requirement and the names of the Gas Company and D.O.G.G.R. representatives responsible for the waiver shall be noted on the tour sheet and in the daily report.

3.6.2. Hydrostatic Pressure Testing

3.6.2.1. All testing or inspection criteria and methodology shall be in accordance with D.O.G.G.R. API and equipment manufacturer's recommendations. Where requirements vary, the stricter guideline or requirement shall apply. BOPE tests performed on a storage zone well or on a shallow-zone well where abnormal pressures may be encountered (such as work performed on a possibly gas-charged shallow zone) shall include a chart of BOPE pressure test(s).

3.6.2.2. Hydrostatic pressure test charts shall bear the time and date of the test, safe working pressure, the actual test pressure, serial number or other identifying number of the item tested and the printed name and signature of the personnel completing the test. When a pressure test is done on a specific wellhead or BOPE stack for a specific well, the name of the well shall also appear on the chart.

3.6.2.3. Where pre rig-up hydrostatic pressure testing is performed in lieu of on-site tests, the hydrostatic pressure testing will be charted and the charts furnished to the Supervising Engineer and/or the Rig Consultant prior to the start of operations that are dependent upon the functionality of the tested equipment.

3.6.2.4. Hydrostatic pressure test of components to be used in the well shall be in accordance with API hydrostatic testing guidelines as follows:

- A primary pressure-holding period
- Reduction of the pressure to zero
- A secondary pressure-holding period

The timing of the secondary holding period shall not start until the test pressure has stabilized and the equipment and the

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pressure monitoring devices have been isolated from the pressure source.

3.6.2.5. Calibrated pressure gages and recording equipment shall be used during testing. Recorder graphs shall be signed, dated and made traceable to the equipment being tested.

3.7. OPERATIONAL REQUIREMENTS

3.7.1. General Operating Requirements

3.7.1.1. Equipment alone cannot prevent a blowout. Proper training and good operational practices are also required for safe operations. This Section sets forth the minimum requirements for training, certification and operational practices. If any difference exists between this document and any other state, federal or local operational requirements, the stricter requirement shall be adhered to.

3.7.1.2. A Rig Supervisor, Storage Field Engineer, or Contract Tool Pusher who has completed semi annual Gas Company BOPE safety training must be present at the rig site whenever the well is open to the storage zone and the crew is working.

3.7.1.3. Blowout prevention practice drills and training sessions shall be conducted at least once each week for each crew. Drills shall be noted on the Tour Sheet and in the Daily Activity Report and should include the nature of the training and the response time as applicable.

3.7.1.4. Training shall, minimally, ensure that rig personnel have:

3.7.1.4.1. A clear understanding of the purpose and method of operation of each preventer and all associated equipment.

3.7.1.4.2. Ability to recognize the warning signs that accompany a kick, and knowledge of the actions that should be taken when such warning signs exist.

3.7.1.4.3. A clear understanding of each crew member's station and duties in the event a kick occurs during any operation, including during drilling, tripping pipe, when drill collars are in the preventers and when pipe is out of the hole

3.7.2. Specific Operating Requirements

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3.7.2.1. Prior to Pulling Pipe from the Well

3.7.2.1.1. With the pumps shut down, determine if the well is flowing or losing fluid. If either is occurring, take appropriate action before pulling out of the well.

3.7.2.1.2. During drilling operations, the Driller shall make an entry on the Tour Sheet, prior to pulling out, regarding the status of the well; whether it is flowing, losing fluid or standing full.

3.7.2.1.3. During drilling operations, the drilling fluid density, along with the density and volume of any pills pumped, shall be noted prior to starting out of the well.

3.7.2.2. Pulling Pipe

3.7.2.2.1. When pulling pipe, the fluid lost due to the loss of pipe volume must be compensated for in a manner such that the bottom hole pressure (BHP) does not fall below the minimum safe over-balance pressure as determined by Section 3.4 of this document.

3.7.2.2.2. If fluid is added beyond the calculated displacement of the pipe or tools removed from the well, the Driller shall make an entry on the tour sheet detailing the amount of fluid added and amount of time over which the fluid was lost to the zone. This information will also be entered in the daily activity report.

3.7.2.2.3. The Driller will record the time, to the nearest minute, that the last pipe or tool was removed from the well.

3.7.2.2.4. In order to track the volume of fluid added to the well, the well shall not be filled continuously unless a trip tank is used.

3.7.2.2.5. If a well is open to a storage or production zone and is to be unattended overnight, a kill string shall be run into the well. The kill string shall be of adequate length such that the weight of the string is greater than the maximum possible upward force that may be exerted on it. The maximum upward force is determined by multiplying the cross sectional area of the kill string by the pressure exerted on it. The kill string shall have the safety valve

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installed and closed and the BOPE shall be closed on the kill string.

3.7.2.2.6. Choke and kill lines shall remain connected to the BOPE stack at all times when the well is open to a permeable zone.

3.7.2.2.7. During drilling operations a usable drill pipe or tubing pressure at high and low kill rate pump speeds shall be known at all times. A high rate is generally considered to be in the 3 - 4 BPM (Barrel Per Minute) and low kill rate speed is generally in the 1 - 2 BPM range.

- When drilling, determine the drill pipe pressure at the designated kill rate at least once per day. Record this information on the Tour Sheet and on the Daily Mud Report.

- During workover operations, determine the tubing pressure at the designated kill rate when the rig first moves onto the well, and whenever a change occurs that would affect the rate, such as a tubing, casing or pump change. Record this information on the Tour Sheet, post it at the rig site and record it in the Daily Activity Report.

3.7.2.3. Fluid Maintenance

3.7.2.3.1. If a reasonable possibility exists that a permeable zone may be encountered with pore pressures exceeding the BHP used for determining the minimum safe over-balance, weight material must be maintained at the drill site in sufficient quantity to increase the density of the drilling fluid by 5 lb./cf.

3.7.2.3.2. Drilling fluids shall be tested at least once per shift to determine viscosity and density. The results are to be recorded on the Daily Mud Report.

3.7.2.3.3. BOPE Operational Inspections

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All BOPE must be routinely inspected. The inspections must meet or exceed the D.O.G.G.R. requirements as specified in the D.O.G.G.R. manual *Blowout Prevention in California*, Sections 2 - 6. All inspections shall be logged in the Tour Sheet.

3.7.2.4. Emergency Operations

In the event of a kick, emergency actions should immediately be undertaken in accordance with established well control methods. At the first opportunity after immediate actions are completed, the **Storage Field Engineer** shall be notified in order to provide any assistance necessary and to be aware of the situation. All kicks are to be logged in the Tour Sheet and in the Daily Activity Report.

4. RECORDS

4.1. All BOPE tests are recorded on a pressure recording chart and kept by the Storage Field Engineer for the duration of the job.

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Company Operations Standard

Operation of Underground Storage Wells	SCG:	224.02

PURPOSE **This document contains guidelines for the operation of underground storage wells. These guidelines are designed to ensure safety, efficiency and compliance with regulations as set forth in both Title 8, Division 1, Chapter 4, Subchapter 14 and Title 14, Division 2, Chapter 4 of the California Administrative Code. The intent is to ensure that all operating and downhole safety equipment used for the production of oil and gas is maintained in good condition to safeguard life, health, property and natural resources**

1. POLICY AND SCOPE

1.1. Storage operating personnel will operate, maintain and test all surface and subsurface well equipment to insure safe operations and compliance with all Company and state regulations

2. RESPONSIBILITIES

2.1. The **Storage Operations Manager** is responsible for all well operations.

3. DEFINITIONS

Not applicable

4. PROCEDURE

4.1. **Well Operations**

4.1.1. Well and operator identification

4.1.1.1. Each well location has a sign posted in a conspicuous place identifying the Company name, name or number of the lease, and the well name. A 24-hour emergency phone number is posted at the well location or field enclosure. In addition, any wells suspected of containing hazardous materials are identified as such.

4.1.2. Well safety devices for gas storage injection and/or withdrawal wells

4.1.2.1. Surface safety devices

4.1.2.1.1. Each well includes the following surface devices:

- Automatic fail-close valve installed in the wellhead withdrawal lines.

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- High-low pressure sensors installed in all flowlines to shut-in the well upon sensing abnormal pressures. High-pressure sensors are not required in any field equipped with flowlines rated to withstand the maximum reservoir pressure encountered under operating conditions.
- Fire detecting fusible plugs installed in pneumatic shut-in control lines at the wellhead.
- Remote, manually operated, quick operating shut-in controls located a recommended minimum of 100 feet from the wellhead.
- Sacrificial sand probes connected to safety valves and designed to shut-in flow from the well in case of excess sand production or corrosive fluid production. The probes should be at points with a high probability of erosion such as the automatic shut-in valve flange or the smallest diameter piping or fitting leaving the wellhead.

4.1.3. Testing and inspection of safety devices

4.1.3.1. All installed well safety devices are tested or inspected (under static conditions) semiannually. Semiannual inspections or tests are completed within the anniversary months established for each well. Testing includes the following:

4.1.3.1.1. Flowline pressure sensors tested for proper pressure settings.

4.1.3.1.2. Automatic wellhead safety valves tested for reliable operating and holding pressure.

4.1.3.2. Each **Storage Operations Manager** or designee maintains records of the present status and history of each installed safety device, as well as dates, details and results of inspections, tests, repairs, reinstallation, and replacements. These records are available to **the Division of Oil, Gas and Geothermal Resources** personnel during business hours.

4.1.4. Enclosures

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4.1.4.1. Facilities, oil and gas (including storage) wells are enclosed according to Company guidelines to prohibit or restrain access as necessary to protect life and property. Any site suspected of containing hazardous materials is identified at the enclosure. This is inclusive of the entire storage facility and is directed by the **Storage Operations Manager** or designee.

4.2. **Wellhead Valve Configuration**

4.2.1. Closing wellhead kill valves

4.2.1.1. Each storage / injection well has an operating and kill side. Normally, wellhead valves on the kill side remain in the open position. However, during wireline operations, preworkover preparation, or routine maintenance, the kill valves may be temporarily closed under the authority of the **Storage Field Engineer.**

4.2.1.2. The **Director of Storage, Storage Engineering Manager or Storage Operations Manager** approves closure of kill valves beyond these routine operations. If, under emergency conditions, these personnel are unavailable, the Region person on-call is responsible for authorizing kill valve operations.

4.2.2. Operating block valves and tubing master valves

4.2.2.1. Closing block valves located on the kill line prevents flow from the well through wellhead kill valves. These block valves are located a recommended minimum of 100 feet from the wellhead. Tubing master valves normally remain in the open position. However, these valves can be closed as needed for wireline or maintenance operations. During installation or removal of the wireline lubricator, the wellhead kill valve and the master valve should be closed during blowdown operations to minimize gas vented to the atmosphere.

4.2.3. Closure of wellhead valves

4.2.3.1. Wellhead valves containing wellhead pressure (e.g., remote kill valves) should never be left closed against the atmosphere. An end-closure device such as a tapped blind flange with a needle valve, or a unibolt is installed over the valve opening to provide a redundant seal.

4.2.4. Killed well valve configuration

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4.2.4.1. Before or after a workover, while the well is killed, the **Storage Field Engineer** is responsible for setting the configuration of the wellhead valves. The **Storage Field Engineer** ensures that provisions are made to prevent surface gas line pressure from exerting gas pressure on a killed well when such pressure applied on top of a column of kill fluid could potentially cause down hole casing damage. All surface piping that is connected to the wellhead should be vented while the well is full of fluid. During workover operations, the **Rig Supervisor** is responsible for the setting of all valves.

4.3. **Well Flow**

4.3.1. Producing the well from the kill side, with the exception of kill fluid unloading or temporary well testing operations, is allowed only if temporary piping is adequately protected with high and low pressure sensors and automatic shut-in valves are installed adjacent to the wellhead. During these temporary operations, provisions are made to kill the well through wellhead valves not involved in the flow.

4.4. **Sacrificial Probes**

4.4.1. When a sacrificial probe fails, the well is taken out of service and investigated to determine the cause of failure. The cause of failure should be diagnosed and corrected prior to returning the well to service.

4.5. **Critical Wells**

4.5.1. The following criteria define a "critical" well:

4.5.1.1. A well capable of flowing on its own and located within 300 feet of the following:

4.5.1.1.1. Any building intended for human occupancy that is not necessary for the operation of the underground storage facility.

4.5.1.1.2. Any airport runway.

4.5.1.2. A well capable of flowing on its own and located within 100 feet of the following:

4.5.1.2.1. Any dedicated public street, highway, or nearest rail of an operating railway.

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4.5.1.2.2. Any navigable body of water or watercourse perennially covered by water.

4.5.1.2.3. Any public recreational facility such as a golf course, amusement park, picnic ground, campground, or any other area of periodic high-density population.

4.5.1.2.4. Any officially recognized wildlife preserve.

4.5.1.3. Any other wells as designated by the **Division of Oil, Gas and Geothermal Resources**. Also, in certain cases the Gas Company may designate a well as "sensitive" due to safety or environmental concerns. These "sensitive" wells fall under the same operational guidelines set forth for critical wells, with the exception of the **Division of Oil, Gas and Geothermal Resources** reporting requirements.

4.5.2. Operation of critical wells

4.5.3. Besides the requirements set forth for all wells, critical wells are subject to additional operational requirements which include the following:

4.5.3.1. A surface controlled, subsurface safety valve installed at a depth of 50 feet or more below the ground level. For shut-in wells capable of flowing on their own, installation of a tubing plug can substitute for a subsurface tubing safety valve. If for any reason a subsurface safety valve is removed from a well, a replacement subsurface safety valve or tubing plug should be promptly installed. A packer is in place to seal the tubing/casing annulus at or below the valve or plug setting depth.

4.5.4. Testing and inspection of critical well safety devices

4.5.4.1. All installed well safety devices are tested or inspected (under static conditions) semiannually. Each semiannual inspection or test is completed within the anniversary months established for each well. Testing includes the following:

4.5.4.1.1. Subsurface safety devices tested for reliable operation.

4.5.4.1.2. Tubing plugs or packers tested for holding pressure.

4.5.4.2. The **Storage Field Engineer** or **Storage Operations Manager** notifies the **Division of Oil, Gas and Geothermal Resources**

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district office before tests are conducted. Test failures not immediately repaired or corrected and not witnessed by a **Division of Oil, Gas and Geothermal Resources** inspector should be reported to the **Division of Oil, Gas and Geothermal Resources** within 24 hours.

5. RECORDS

5.1. All pertinent data regarding well operations and wellhead conditions are collected and recorded on the station daily log or the daily gas withdrawal/injection data sheet. Sacrificial probes that have failed are inspected by the **Storage Field Engineer**. The **Storage Operations Manager** or designee also maintains records on sacrificial probe installation, failure and replacement.

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Company Operations Standard

Operation of Underground Storage Wells	SCG:	224.02

NOTE: Do not alter or add any content from this page down; the following content is automatically generated.
Brief: Document was fully reviewed. The word "Division" replaced the word "Department" regarding the DOGGR. Resopnsibilities of the "Storage Field" were changed to "Storage Operations Manager or designee".

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PURPOSE **Gas Storage Operations monitors, verifies, and reports the gas inventory in underground storage reservoirs by following the methods identified in this gas standard.**

1. POLICY AND SCOPE

1.1. Gas Storage Operations require monitoring and inventory verification for safe long-term management of underground gas storage operations. While no single method can be used to precisely monitor and verify the gas inventory in underground storage reservoirs, the three engineering methods in general use are summarized in sections 4.1 – 4.3.8.1. Only combining and analyzing available field data can gas volume verification be obtained. Based on this analysis, gas volume changes or losses are recognized, estimated and reported.

2. DEFINITIONS

When gas storage operations are initiated in an oil or gas reservoir, there is an initial gas content in the reservoir prior to injection. Initial gas content is generally composed of both free gas and solution gas. Additional gas is added to the initial gas content by injection, and the combination comprises the Total Storage Volume. This volume is categorized as follows:

2.1. **Cushion Gas**

The volume of gas which is required in underground storage field to maintain minimum field pressure.

2.2. **Recoverable Cushion Gas**

This is defined as the volume of gas that can be economically recovered from the reservoir below the base gas pressure. This volume varies, depending upon economic conditions.

2.3. **Non-Recoverable "Cushion Gas"**

This is the volume of gas left in the reservoir after all recoverable gas volumes are removed and is not considered a part of Total Storage Inventory. This gas is capitalized and depreciated over the life of the project.

2.4. **Working Gas**

Volume of gas present in an underground storage field, which is available for withdrawal, although not all of the working gas may be utilized in a given year due to cycle volume constraints. This volume is in addition to the cushion gas volume.

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2.5. **Effective Working Gas**

This volume is defined as the working gas which is withdrawn and re-injected in a complete injection and withdrawal cycle. Ideally, the effective working gas volume is synonymous with the working gas volume. However, limitations by wells, compression facilities, or gas availability may limit effective working gas volume.

2.6. **Total Storage Inventory**

This is the sum of both the working and recoverable cushion gas volumes.

3. RESPONSIBILITY

The responsibilities for shut-ins, along with analyzing data, verifying gas inventory, and reporting changes or losses are specified in **Standard 224.0020,** *Gas Inventory Verification – Shut-In.*

3.1. At least once every two years the validity of the reported inventory for each storage field is evaluated using the methodologies outlined in this gas standard. A report is prepared that verifies that the reported inventory is within the range that would be expected from the reservoir analysis. Corrective action is taken if necessary. The report is prepared under the direction of the Storage Engineering Manager and approved by the Director of Storage. The report is directed to the **Director – Customer Billing Operations** and copied to the **Measurement Data Operations Manager** and the **Director – Transmission & System Operations**.

4. PROCEDURE

4.1. MONITORING

4.1.1. Monitoring of the storage reservoir ensure the reservoir functions, according to expectations, and integrity tests verify the gas inventory is present and available for delivery. Effective monitoring requires a thorough understanding of the reservoir system. This system is defined as the reservoir rock and wellbores, which respond to pressure changes as a result of gas injection and withdrawal.

4.1.2. Monitoring of the reservoir system is conducted in both storage and non-storage zone wells and at surface observation points.

4.1.2.1. Storage Zone Wells – Performance reviews utilize information collected during individual well and reservoir tests. Parameters such as back pressure curve shifts, changes in deliverability and field performance are investigated.

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4.1.2.1.1. Surface pressures on each well are measured and recorded weekly using a calibrated test gauge. These include tubing pressure, casing pressure, annuli pressures, and, if applicable, safety valve control line pressures. The mode of well operation (injection, withdrawal or shut-in) at the time of pressure measurement is also recorded. Note that the ***C.D.O.G.G.R. (California Division Of Oil, Gas, and Geothermal Resources)*** requires a monthly average casing and tubing pressure be submitted as part of the monthly production report.

4.1.2.1.2. A plot of the weekly surface casing and the innerstring annuli pressures versus time is maintained for each well. Hardcopy plots are created, marked and filed when an abnormal pressure is encountered. A pressure is considered abnormal when it may be large enough to force gas into a normally pressured water sand, either at the surface casing shoe or through any other known casing holes or leak-paths.

4.1.2.1.3. When abnormally high annular pressures are detected, diagnostic steps are taken to determine the source of pressure build up. This includes tests to eliminate surface valves and downhole tubing as possible sources of leakage. Zero pressure is abnormal in a well that has had a history of annular pressure and is investigated for the possibility of a closed valve.

4.1.2.1.4. All wells with continuing zero pressure readings are checked quarterly for closed valves and noted on the pressure plot. Blowdowns are also noted when they occur.

4.1.2.1.5. Wellhead inspections are performed on a monthly basis. Any leaks from wellhead flanges and valves are reported and corrected.

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4.1.2.1.6. Subsurface temperature surveys are conducted on each well in according to the following schedule: semi-annually in La Goleta and Playa del Rey storage fields and annually in the Aliso Canyon and Honor Rancho storage fields.

4.1.2.1.7. Surveys are done in accordance with CDOGGR regulations. Wells that have been killed are not exempt from this requirement and must be surveyed according to the schedule. Results of surveys are reported according to **Standard 224.001**, *Standardized Well Activities Reporting.*

4.1.2.1.8. Additional surveys will be run without regard to this schedule at the first indication of unusual or abnormal well conditions, i.e., anomalous pressure, surface gas emissions or other indications of well problems.

4.1.2.1.9. Wireline retrievable tubing obstructions such as tubing plugs, subsurface safety valves, subsurface chokes or tubing stops are removed once each year to perform a temperature survey of the casing shoe and cap rock seal. Ideally, this is done at high reservoir pressure when shoe leaks are most noticeable on temperature surveys. Under certain conditions it may not be possible or advisable to remove the wireline retrievable obstruction.

4.1.2.1.10. Subsurface surveys using wireline conductor cable equipment are made to investigate anomalies discovered by temperature surveys. Conductor cable surveys include temperature surveys, noise logs, spinner surveys, and radioactive tracer surveys.

4.1.2.1.11. In the case of well casing leaks above the shoe, radioactive tracer surveys are typically used to verify the location of gas movement through the leak. In the case of shoe or cap rock leaks, these additional surveys are used to verify that a leak exists and to qualitatively estimate a leakage rate.

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4.1.2.1.12. Gas cap observation wells are used to monitor reservoir pressure. If possible one or more wells completed in the gas cap are selected for observation purposes. These wells are not used for injection and are put on withdrawal only for peak load conditions. Surface pressure measurements on the tubing and casing of each gas cap observation well are made and recorded weekly.

4.1.2.1.13. A plot of these pressures versus inventory is kept in the office of the **Storage Field Engineer** and is updated weekly. Anomalous well pressures or behavior are reported to Storage Engineering Staff.

4.1.2.1.14. Reservoir shut-ins are generally on a schedule stated in **Standard 224.0020,** *Gas Inventory Verification – Shut-In* or when determined as necessary by the Storage Field Engineer.

4.1.2.2. Non-storage Zone Wells

Non-storage zone wells monitored include both Company wells and wells owned by others in overlying and underlying zones and in other fields within two miles of the storage reservoir boundary, where applicable. These wells are categorized as follows:

4.1.2.2.1. Pressure observation wells are located in overlying and underlying permeable formations, or adjacent to the storage reservoir but across assumed confining boundaries, such as faults, permeability pinchouts, below the gas-liquid contact or beyond the spill point of the storage zone's confining structure. Although normally static, these wells may have artificial lift mechanisms for removal of gas and fluids.

4.1.2.2.2. Gas collection wells are located where known gas migration from the storage zone is intercepted and collected. These wells are normally equipped with operating artificial lift mechanisms so that both liquids and gas can be produced, causing a pressure sink in the reservoir near the wellbore.

4.1.2.2.3. In some fields, shallow water observation wells have been drilled into aquifer zones existing in the first permeable sand above the shoe of the surface casing.

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These wells are shut-in at the surface and gas concentrations in the wellbore are measured weekly.

4.1.2.2.4. If gas loss is expected, performance reviews of wells operated by other producers in either overlying zones or in adjacent fields may be made by reviewing production reports from these operators.

4.1.2.2.5. Performance of Company-owned observation and collection wells are also closely monitored. Wellhead inspections and temperature surveys are performed on the pressure observation wells and the gas collection wells.

4.1.2.2.6. Pressure observation wells

- Surface pressures on all tubing and casing strings are measured weekly using a calibrated test gauge.
- A plot of pressure versus time for each well is kept by the Storage Field Engineer. Bottom-hole pressure surveys are run as needed on pressure observation wells.
- If a substantial increase in reservoir pressure is noted or a significant gas buildup occurs, an attempt may be made to produce the well. Produced gas is sampled and analyzed for both hydrocarbon and helium content.

4.1.2.2.7. Gas collection wells

- Surface pressures on all casing strings and safety valve control lines are recorded weekly using a calibrated test gauge. The mode of well operation (producing, shut-in) at the time of pressure measurement is also recorded.
- A plot of pressure vs. time for each surface casing and innerstring annulus is generated and kept by the **Storage Field Engineer**.
- Bottom-hole pressure surveys are run on gas collection wells as needed. These surveys follow a shut-in period to allow pressure

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stabilization after production. If the well is equipped with a standing valve, the valve is pulled prior to the bottom-hole pressure survey and is reinstalled upon completion of the survey.

- The Storage Field Engineer develops production schedules. The Storage Field Engineer maintains plots of bottomhole pressure versus time and records of produced gas, oil and water.

4.1.2.2.8. Shallow water observation wells

- Shallow water observation wells are closed-in at the surface and gas concentrations in the wellbore is measured periodically.

4.1.2.2.9. Surface Observations

- Surface observations are conducted by Station Personnel under the direction of local management and the resident Storage Field Engineer assigned to each Facility.

- Frequency and type of observations are determined and prescribed by local O&M procedures based on conditions particular to each Facility.

- In the event of major seismic activity or the occurrence of a significant gas loss or migration problem as identified by the Storage Field Engineer, local management with the assistance of the Storage Engineering Group will conduct inspections of certain well cellars, surrounding surface locations and previously abandoned wellbores as deemed necessary.

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4.2. BOTTOM-HOLE PRESSURE DETERMINATION

4.2.1. Each of the three major methods used to verify gas storage inventory, as explained in Section 5, requires the determination of bottom-hole pressures. The method used to determine bottom-hole pressure must be consistent from year to year. The most accurate method to determine bottom-hole pressure is to measure the pressure with a pressure bomb. In certain applications the bottom-hole pressure can be calculated from the shut-in wellhead pressure. For wells completed in the gas cap and having full gas columns, the bottom-hole pressure is calculated from the equation:

$$P_{BHP} = P_{WH} \exp\left(\frac{0.01875 \times SG \times D}{Z_{avg} T_{avg}}\right)$$

Where:

P_{BHP} = Bottom-hole pressure, psia.

P_{WH} = Wellhead pressure, psia.

SG = Gas specific gravity.

D = True vertical depth in feet.

T_{avg} = Average wellbore temperature between surface and bottom-hole, degrees Rankine.

Z_{avg} = Average gas compressibility factor from charts, tables or computer programs (dependent on P_{avg}, T_{avg} and gas gravity).

P_{avg} = Average pressure between surface and bottom-hole, psia or $P_{avg} = (P_{BHP} + P_{WH}) / 2$

NOTE: The above equation could yield incorrect results if the well exhibits a significant fluid level.

4.3. INVENTORY VERIFICATION – SHUT IN

4.3.1. Three primary methods for inventory verification of gas storage fields are referenced and summarized below:

4.3.1.1. Calculation of gas content based on volumetric data and average reservoir pressure; Volumetric Determination is explained in

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Applied Petroleum Reservoir Engineering; by Craft, B. C. and Hawkins, M. F.; Englewood Cliffs, N.J.: Prentice- Hall, 1959.

4.3.1.2. Calculation of effective gas content using the simple gas material balance, hysteresis curve, and P/Z curve methods; Material Balance is explained in Natural Gas Engineering by Ikoku, C. V.; Tulsa, Oklahoma: Penn Well Publishing, 1980.

4.3.1.3. Verification of storage inventory by comparing measured reservoir pressures with calculated pressures obtained using the single cell material balance or reservoir simulation methods; Numerical Simulation or Reservoir Modeling is explained in Modern Reservoir Engineering —A Simulation Approach by Crichlow, H. B.; Englewood Cliffs, N.J.: Prentice- Hall, 1977 and the Intercomp Beta II User Manual.

4.3.2. The most common inventory verification method used in mature gas storage projects that are known to have effective geologic closure is the hysteresis curve or P/Z versus inventory plot. Typically, it is adjusted annually for known gas losses and liquid production. Any shift between points plotted at similar pressures following a shut-in is further investigated.

4.3.2.1. Tracking known gas losses and transfers as they occur assist with inventory verification.

4.3.2.2. Recommended shut-in time durations for effective reservoir stabilization are listed below

4.3.2.2.1. Aliso Canyon -14 days

4.3.2.2.2. Honor Rancho -12 days

4.3.2.2.3. Goleta- 5 days

4.3.2.2.4. Playa del Rey – 4 days

4.3.3. Data collected during a shut-in period includes accurate measurements of reservoir pressure on each available well. Bottom-hole pressures can be calculated from surface pressures or measured directly. Gas gravity is determined using gas samples from individual, representative wells.

4.3.4. The **Storage Field Engineer** chooses the type and frequency of data to be collected during shut-ins.

4.3.5. Calculation of gas content based on volumetric data and average reservoir pressure from shut-in.

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4.3.5.1. Average reservoir pressures used in this calculation are obtained during shut-in periods required for reservoir pressure stabilization. Reservoir pore volumes available for gas storage are calculated from either geologic information, material balances using production and pressure information obtained during primary field production, or in some cases from pressure and production data obtained during gas storage operations. Elements of these calculations are described below:

4.3.5.2. Average reservoir pressures are calculated in an appropriate way for each storage reservoir. To be reliable, the method for each field should stay consistent for all years. Various methods of calculation include the following:

4.3.5.2.1. The average reservoir pressure for Honor Rancho, La Goleta, and Playa del Rey are determined by calculating the arithmetic average of the bottom-hole pressure in the gas cap wells. In these fields the pressure of each well is measured or computed at a specified subsea datum approximately at the midpoint of the zone. The datum and reservoir temperature used for these fields are as follows:

- Honor Rancho - 8,300 feet subsea, 190°F
- La Goleta - 4,200 feet subsea, 150°F
- Playa del Rey - 6,100 feet subsea, 210°F
- A volumetrically weighted average reservoir pressure is used for Aliso Canyon. The pressures in this field are computed at a specified subsea depth approximately at the midpoint of the zone. The datum depth for this field and the reservoir temperature are as follows:
    - Aliso Canyon - 5,400 feet subsea, 180°F

4.3.6. Reservoir pore volume calculated from geologic information uses data obtained during the drilling and completion of the well, such as electric logs or core information to calculate the total pore volume of the reservoir. These calculations are based on the following equations:

4.3.6.1. Gas reservoirs

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4.3.6.1.1. Equation: $V = Ah\phi (1-S_w)$

Where:

$V =$ Reservoir gas pore volume in cubic feet

$A =$ Gas zone area in square feet

$h =$ Average gas zone thickness in feet determined from electric logs or cores

$\phi =$ Porosity fraction determined from porosity logs or core analysis

$S_w =$ Water saturation from log, core analysis

4.3.6.2. Oil reservoirs

4.3.6.2.1. Equation: $V = Ah\phi(1-S_w) + A_1h_1\phi (1- S_{1w}-s_o)$

Where:

$A =$ Primary gas cap area in square feet

$A_1 =$ Secondary gas cap area in square feet

$h_1 =$ Average secondary gas zone thickness in feet

$s_o =$ Residual oil saturation

4.3.6.2.2. In most portions of an oil zone storage reservoir, oil saturation is determined from core analysis or can be considered equivalent to residual oil saturation and can be estimated from the 16" normal resistivity curve using the following relationships.

Equation: Residual oil saturation = $(1-s_{xo})$

$$s_{xo} = \sqrt{\frac{Rmf}{R_{xo}\phi 2}}$$

Where:

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R_{xo} = Resistivity of 16" normal or resistivity of flushed zone.

S_{xo} = Water saturation of mud filtrate within the flushed zone.

ø = Porosity

Rmf = Resistivity of mud filtrate.

4.3.6.3. Gas reservoir pore volume calculated using material balance equations:

These calculations utilize production and pressure data in the following equations:

4.3.6.3.1. Equation for constant volume gas reservoirs using primary production:

$$V = \frac{P_{SC} G_P T}{T_{SC}} \left(\frac{1}{P_i / Z_i - P_f / Z_F} \right)$$

Where water production and influx are assumed negligible and where:

V = Gas pore volume in reservoir cubic feet.

P_{sc} = 14.7 psia

G_p = Gas produced in standard cubic feet.

T = Reservoir temperature in degrees Rankin (°R).

R_{sc} = 520°R

P_i = Initial pressure, psia.

P_f = Final pressure, psia.

Z_i = Initial gas compressibility factor.

Z_f = Final gas compressibility factor.

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4.3.6.3.2. Equation for constant volume gas reservoirs using storage production

$$V = \frac{P_{SC} G_P T}{T_{SP}} \left(\frac{1}{P_1 / Z_1 - P_2 / Z_2} \right)$$

Where water production and influx are assumed negligible

G_p = SCF of gas produced or injected between pressure points P1 and P2.

P1 and P2 = The first and second stabilized average reservoir pressures bounding the production or injection period considered.

Z1 and Z2 = Gas compressibility factors for P1 and P2.

T = Reservoir temperature in degrees Rankine

4.3.6.4. Oil reservoirs pore volume calculations

4.3.6.4.1. Equation: The 'Reservoir Gas Pore Volume' is equal to the 'Original Gas Cap Pore Volume' plus the 'Secondary Gas Cap Pore Volume' plus the 'Space created by Water Production'.

Or:

$$V = GB_{gi} = \left(NB_{oi} - \left(N - N_p \right) B_o \right) + W_p B_w$$

Where:

G = Original gas pore volume, standard cubic feet (determined from either geologic data or an appropriate form of the material balance equation).

B_{gi} = Gas formation volume factor in reservoir cubic feet per standard cubic feet at discovery pressure.

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N = Initial oil in place in stock tank barrels (determined from either geologic data or an appropriated form of the material balance equation).

N_p = Cumulative oil production in stock tank barrels.

B_{oi} = Oil formation volume factor in reservoir cubic feet per stock tank barrel at discovery pressure.

Bo = Oil formation volume factor at existing pressure in reservoir cubic feet per stock tank barrel.

W_p = Water production in stock tank barrels.

B_w = Water formation volume factor, reservoir cubic feet per stock tank barrel (approximates 5.615).

4.3.6.4.2. Simplifying assumptions used in the above equation are that no storage gas goes into solution in the oil and that there is no water influx into the storage reservoir. These simplifying assumptions are seldom true. However, the equation can be modified based on a judgment of the volume of gas which may go into solution in the reservoir oil and a judgment of aquifer activity surrounding the storage reservoir. When modified by these judgment factors, the equation provides a method for approximating a limit for the reservoir gas pore volume available for storage operations. An upper limit is established when it is assumed that all the residual oil is re-saturated with gas. Generally, only a fraction of the oil becomes saturated and so the calculation has little usage beyond setting limits.

4.3.6.4.3. The values of G and N are not generally expected to be obtained with an accuracy greater than +/- 20%. However, this is not a major drawback since the methods are used to establish guidelines and set limits.

4.3.6.5. Calculation of gas content.

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4.3.6.5.1. After the gas pore volume has been calculated, or approximated, by one of the methods indicated above, the gas content at the measured reservoir pressure is determined using the gas law as follows:

PV = ZNRT

Where:

P = Average reservoir pressure, psia

V = Gas pore volume in reservoir cubic feet

T = Temperature of reservoir, (°F + 460) degrees Rankine

Z = Compressibility factor, dependent on P, T, and gas gravity, from charts or tables.

N = pound moles (where one pound mole =379.41 cubic feet @ 60°F and 14.7 psia).

R = 10.735 universal gas constant for above units.

Solving for gas content;

$$Volume(mscf) = \frac{(0.03533)PV}{ZT}$$

4.3.7. Calculation of effective gas content using the simple gas material balance and hysteresis curve (P/Z curve) methods.

4.3.7.1. Pressure changes, with rapid gas injection or withdrawal during selected operating periods, can show the relationship between effective gas content and the storage inventory. Effective gas content is the gas which, within a given time, causes a measurable pressure response to injection or withdrawal operations. Not all gas in the reservoir yields such a response within the given time interval. The difference between effective gas content at a given pressure (P_1) and the metered inventory is non-effective gas. Part of this non-effective gas can be due to the lack of pressure equilibrium within the reservoir. Any gas migration out of the storage reservoir also contributes to the non-effective gas. Either one of the two equations, or the graphical solutions presented below are used to calculate the effective gas content.

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4.3.7.1.1. Calculations with negligible water movement are made using the following equation:

$$\text{Effective Gas Content at P1, Q1} = \left(\frac{\Delta Q}{\frac{P_1}{Z_1} - \frac{P_2}{Z_2}} \right) \left(\frac{P_1}{Z_1} \right)$$

Where:

P_1 = Pressure at the first operational point considered.

P_2 = Pressure at the second operational point considered.

Q_1 = Net storage volume at the first operational point considered.

ΔQ = The net change in gas inventory between the two operational points considered.

4.3.7.1.2. Calculations with significant water movement of a known rate are made using the following equations:

$$Q_1 = \left(\Delta Q - \left(We \times \frac{P_2}{14.7} \times \frac{520}{T_R} \times \frac{1}{Z_R} \right) \right) \frac{\frac{P_1}{Z_1}}{\left(\frac{P_1}{Z_1} - \frac{P_2}{Z_2} \right)}$$

Where terms are defined as above, and where:

We = Water influx in cubic feet.

T_R = Reservoir temperature, degrees Rankine.

Z_R = Z at T_R and P_2.

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4.3.8. Graphical solutions

4.3.8.1. The hysteresis curve is a plot of reservoir pressure versus storage inventory. This curve utilizes the compressibility factor of non-ideal gas. It is most effective in a constant volume reservoir since it assumes no water movement into or away from the storage reservoir; and no movement of gas into or out of solution in the reservoir oil. Actually, after sufficient storage history, the hysteresis curve becomes a qualitative/quantitative tool for inventory when a storage field is operated in a consistent manner and storage cycle volumes are relatively consistent over time. Under these conditions, aquifer movement and movement of gas into and out of solution is relatively constant and effectively drops from the equation.

4.4. REPORTING GAS INVENTORY LOSSES

4.4.1. Calculated operational losses

4.4.1.1. Gas losses due to compressor, piping system or well blowdowns and wireline surveys are calculated by Storage Operations personnel and reported to Measurement monthly. These reports are reviewed by the Storage Field Engineer.

4.4.1.2. Estimates of losses related to workovers and well blowdowns are prepared by the Storage Field Engineer after a well has been killed. These estimated losses are reported monthly to Gas Measurement.

4.4.2. Losses from known well and surface facility leaks

4.4.2.1. Some small losses from valves, compressors, field piping, threaded well casing connections and well casing mechanical devices such as cementing stage collars, and some small casing leaks are inherent to **Storage Field Operations**. These leaks are estimated and reported as follows:

4.4.2.1.1. Minor surface facility leakage is surveyed in each storage field periodically. Leakage surveys include wellhead valves and fittings, instrumentation, well piping, field piping, surface production facilities and the compressor station. Surveys are made more frequently if facility modifications are made which might change leakage rates.

4.4.2.1.2. During these surveys, measurements are obtained on representative minor atmospheric leaks and then

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extrapolated to an estimated annual leakage rate for the field.

4.4.2.1.3. Subsurface leakage from wells is estimated by the **Storage Field Engineer** and reported to **Storage Engineering Staff.**

4.4.2.1.4. Leakage from well casings is estimated by establishing a leakage rate using the radioactive tracer survey. The number of days of leakage is estimated by using subsurface temperature survey data. Casing shoe or Water Shut-Off (WSO) leakage is estimated by reviewing temperature, noise and radioactive tracer surveys, pressure draw-down and the overlying wells' gas production during the time of the leak.

4.4.2.1.5. In cases where leakage rates are not quantifiable, an average rate of 30 Mcf/d may be used. Engineering judgment is then applied and an average daily loss rate selected. The number of days the leak was occurring is determined by taking one-half the difference in the number of days between the last normal and the first abnormal temperature survey.

4.4.2.2. Surface facility leakage and subsurface leakage are quantified annually by the **Storage Field Engineer** who reports the results to the **Storage Engineering Manager** and **Measurement Data Operations**.

4.4.3. Reservoir losses

4.4.3.1. Reservoir losses are categorized as those associated with Company-operated wells completed in the storage reservoir and general reservoir losses.

4.4.3.1.1. Losses associated with the Company-operated wells include losses through failures in the cement between the cap rock and well casing. These losses are also known as "shoe leaks," "WSO" leaks and "stage collar" leaks.

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4.4.3.1.2. General reservoir losses include losses through abandoned wells or breakdown of some portion of the trapping mechanism. This type of loss is not directly detected by surveys of Company-operated wells in the storage zone.

4.4.3.1.3. Quantification of reservoir losses utilizes industry accepted methods of inventory verification.

4.4.4. Reservoir losses are quantified annually by the **Storage Field Engineer** who reports results to the **Storage Engineering Manager** and **Measurement Data Operations.**

4.4.5. Gas storage field measurement audits

4.4.5.1. When Storage Engineering identifies a consistent discrepancy in the pressure or P/Z versus Inventory relationship of 1 Bcf or 3% of the working inventory volume, whichever is less, at a storage field that cannot be explained by known leaks such as gas vented to the atmosphere, liquid production or other reservoir changes, they request an audit of the gas measurement systems at the storage field by the Measurement, Regulation and Control (MRC) group of Gas Engineering.

4.4.5.2. MRC investigates the following parameters with assistance from Storage personnel.

4.4.5.2.1. MRC Design Team obtains the most current drawings and block flow diagrams for the storage field.

4.4.5.2.2. MRC Design and Storage Field personnel inspect the facility to determine the accuracy of current drawings.

4.4.5.2.3 MRC Design and Storage Field personnel identify any changes in metering or gas processes that have occurred since the drawings were last issued.

4.4.5.3 MRC reviews Storage Field Ledger calculations in order to verify they agree with updated drawings and block flow diagrams. MRC documents any errors found in the Ledger formulas and advised MDO of any required Ledger formula revisions.

4.4.5.4 MRC in conjunction with the drawing confirmation prepares a list of the meters, instrument configuration and associated transducer ranges.

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4.4.5.4.1 MRC compares this listing to information in the Measurement Collection System (MCS) for those sites that MCS re-calculates the volumes and notes any discrepancies and impact of those discrepancies on measurement accuracy.

4.4.5.4.2 MRC compares information in the Instrument Configuration for those site where the Scada Pack calculates the volumes and notes any discrepancies and impact of those discrepancies on measurement accuracy.

4.4.5.5 MRC Measurement Technology reviews Storage Field calibration and meter inspection results to insure adherence to the Gas Standards and System Instructions listed below. Any discrepancies or errors will be documented and impact on measurement noted.

- **Standard 223.0360** Instrument Maintenance – Storage Field and Transmission Facilities
- **Standard 185.0455** Flow Measuring Devices – Field Maintenance
- **Standard 185.0475** Orifice Meters and Orifice Plates - Field Inspection and Maintenance
- **Form 4682-B** Orifice Meter Order
- **Standard 185.0452** Daniel Ultrasonic Meter - Operation and Maintenance
- **Standard 185.0425** Rotary Meters - Field Maintenance, Inspection and Repair
- **Standard 185.0530** Turbine Meters - Operation, Maintenance and Spin Test
- **Standard 185.0474** Control Microsystems SCADAPACK
- **Standard 185.0457** Totalflow Inspection and Calibration Requirements for 6610, 6413, 6713 & X-Series
- **Standard 185.0458** Totalflow Inspection and Calibration Requirements for 6611, 6414, 6714 & X-Series
- **Standard 185.0461** Galvanic Gas Micro - Installation and Field Maintenance
- **Standard 185.0515** Temperature Devices – Maintenance

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4.4.5.6 Storage Field Orifice Meter or Ultrasonic Meter (USM) inspections will be witnessed by MRC Measurement Technology to confirm conformance to applicable Gas Standards listed in Section 4.4.5.5. A borescope inspection may be recommended if metering inspection results warrant further investigation.

4.4.5.7 MRC Measurement Technology to review the last 12 months of MCS Hourly data for each Storage Field Meter on the Ledger to verify meters are operating within their minimum and maximum ranges.

4.4.5.7.1 Verify operating Orifice Differential Pressure (DP) are 9" w.c. or greater on average, Beta ratio within the range of 0.2 to 0.6 and orifice plate thickness and bevels in accordance with AGA 3

4.4.5.7.2 MRC Measurement Technology will also review borescope inspection results. Impact on measurement accuracy will be noted for any negative findings.

4.4.5.8 MRC Technology to issue final report to Storage Field, MRC and MDO summarizing all findings, quantifying all measurement errors and detailing any revisions required to MCS Ledgers or Company Drawings.

4.4.5.8.1 Report will also recommend any follow-up actions required by Storage Field, MRC Design or MDO.

4.4.5.9 The final report results are reviewed and signed off on by:

- Director of Storage
- Storage Engineering Manager
- Storage Operations Manager
- Measurement Regulation and Control (MRC) Manager
- Contract and Compliance Manager - Measurement Data Operations (MDO)
- Storage Technical Services Manager (TSM)

5. RECORDS

5.1. Surface Pressure Taken during Shut-in., P/Z Calculations and Plots are maintained as records. Retention of all records is in accordance with Sempra Energy's company policy.

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NOTE: Do not alter or add any content from this page down; the following content is automatically generated.
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Response to Data Request

Response to SED Data Request-63

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 63 related to the Reply Testimony of Mr. L. William Abel on behalf of SoCalGas.

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1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on April 2, 2020. Data Request No: SED 63 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED DR 63 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The passages are from the document titled: Chapter III, Prepared Reply Testimony of L. William Abel on behalf of Southern California Gas Company (U 904 G) (file name: "3_Ch. III - Abel (A Final).pdf").

2 Questions and Responses

2.1 Question 1

1. On page 12, "Blade's modeling simply represents an academic exercise to calculate the kill fluid density and pump rate that theoretically *could have* killed SS-25, and fails to account for several important safety considerations that impacted Boots & Coots' well kill efforts. First, as Boots & Coots explained to SED during SED's August 2018 examination, the first step upon arriving at a well control event is to secure the area and ensure the safety of personnel. [Footnote omitted.]. Indeed, as discussed in SoCalGas' opening testimony, safety is a paramount consideration in any well control operation, and the response to the SS-25 leak was no different—extensive measures were implemented to mitigate the risk of ignition. [Footnote omitted]. Second, in designing a well kill plan, a well control company must take extreme caution not to implement a well kill operation that may worsen the leak, and thereby increase the risk of ignition, or jeopardize the success of subsequent kill attempts. Boots & Coots appropriately considered these factors, and made adjustments to its kill operations accordingly." With this passage on mind, please answer:

2.1.1 Questions and Blade Responses

a. Does Blade agree that, "Blade's modeling simply represents an academic exercise to calculate the kill fluid density and pump rate that theoretically could have killed SS-25?"

   No.

b. If Blade disagrees with this statement, please state the reasons for disagreeing.

   Blade's efforts to model the kill operations were not an academic exercise—it was specifically to ascertain why the top kill well-control efforts were unsuccessful and why it took 111 days to stop the gas from the Aliso Canyon gas storage reservoir from escaping to the atmosphere. As discussed in the Blade Report [1] (page 229), Blade conducted a transient kill simulation study to evaluate the likelihood of success of the actual kill attempts. Blade intentionally used the same field data that were available to the onsite well control personnel during the time of well kill operations for this evaluation. According to Blade's modeling, all the SS-25 kill attempts were predicted to be unsuccessful.

   It is not clear to Blade how Boots and Coots selected the pump rates and kill fluid densities for each kill attempt. The kill fluid densities did not change materially until kill attempt #7.

c. Does Blade take the position that its modeling would have successfully killed well SS-25?

   Because of the modeling and kill attempt operational uncertainties, no one can guarantee a successful well kill strictly based on modeling results. Modeling to determine a plan for the pumping operations is the first important component of a well kill plan. The modeling uses available data and reasonable engineering assumptions for unknown data. In fact, the advantage of modeling is that it allows for evaluation of uncertainties in the data and assumptions. The second component of a kill operation is to carry out the pumping operations according to the plan developed through modeling. If the modeling results are flawed, or if the pumping operation does not go as planned, a well kill attempt will likely be unsuccessful.

Blade takes the position that kill modeling is necessary to properly plan a kill operation where early success in killing the well is of high importance. Such modeling could include transient kill modeling or other analytical approaches that take into account pressure, kill fluid properties, flow rates and restrictions in the flow path. There was no evidence provided to Blade that kill modeling or other analytical approaches were undertaken for kill attempts #1 through #6.

Furthermore, Blade contends that by the time of kill attempt #2, the complexity of the kill operation should have been well understood. Twenty days were available to gather data on the well conditions during the time interval between kill attempts #1 and #2. Diagnostic logs were run in the well showing temperature anomalies and possible leak depths. By then it was clear that there was a leak in the 7 in. casing at some shallow depth; and this was documented in the daily reports. This time period was adequate to conduct kill modeling. Gas was flowing from the reservoir up through the 7 in. casing × 2 7/8 in. tubing annulus and then outside of the 7 in. casing. The gas was escaping into the surrounding formation and some was migrating to the surface. This was not a standard top kill operation based on the available data.

The following are examples of data and assumptions that could have been made regarding the leak severity, leak depth, and flow path:

- The SoCalGas SS-25 daily report for October 24, 2015 [2] stated "At this time, It [sic] appears that we had a wellhead seal leak and/or a very shallow 7" production casing leak."
- The temperature log run on November 8, 2015 [3], showed cooling anomalies at 365 ft and 890 ft indicating the possible depths of gas expansion and cooling associated with a leak.
- The Boots & Coots daily report on November 13, 2015 (Add Energy Report [4], page 89, AC_BLD_0031392), stating that after pumping junk shots down the 2 7/8 in. × 7 in. annulus, brine was observed after 5 bbl were pumped.
- Both Add Energy [4] (page 9, AC_BLD_0031312) and Blade [5] (page 51) estimated the SS-25 gas flow rate using data that was available at the time of the leak. Add Energy stated on page 7, "This estimated flow rate is not dependent of the flow path from the bottom of the tubing to surface, but only calculated based on pressures and the inflow performance relation (IPR) estimated from well tests."

A kill design is based on the well parameters such as geometry, flow path restrictions, and gas flow rate as well as the kill parameters including kill fluid density, pump rate, fluid volume, and surface pump pressure. Kill modeling is an effective way of accounting for these variables and their uncertainties and then screening well kill plans to determine which plans may be successful and which are likely to be unsuccessful thereby maximizing the chances of success. Kill modeling is safer, more efficient, and less risky than pumping multiple unsuccessful kill attempts. The risk of unsuccessful kill attempts includes damage to the site and the well's surface equipment that can limit additional kill attempts. The modeling allows learnings from each kill attempt to be incorporated into the next one. The seven unsuccessful kill attempts at SS-25 resulted in a large and deep crater around the wellhead and conductor casing creating a hazardous condition and required waiting for the relief well to stop the gas flow from SS-25 to the atmosphere.

Question 1 includes a comment on safety considerations and the following statement:

> Second, in designing a well kill plan, a well control company must take extreme caution not to implement a well kill operation that may worsen the leak, and thereby increase the risk of ignition, or jeopardize the success of subsequent kill attempts.

Blade agrees with this statement. This is exactly why kill modeling is a necessary component of designing a successful well kill plan. However, evidence indicates that this did not happen at SS-25. The use of higher density fluids, as predicted by the kill modeling, would not have compromised safety during the kill attempts. Specifically, kill attempt #2 resulted in the formation of the crater around the wellhead and conductor. Similarly designed, unsuccessful kill attempts continued after kill attempt #2. During kill attempt #6, the flow line from the 7 in. casing and tubing head broke, monitoring devices were damaged, and the pump line to the casing head broke. The pump line tee broke off because of wellhead movement and the 11 3/4 in. × 7 in. annulus valve backed out during kill attempt #7 allowing the annulus to vent gas at surface and enlarge the crater. The additional kill attempts continued even when the well and surface conditions had deteriorated from after kill attempt #2.

Blade was provided with what appear to be some graphical results of modeling for kill attempt #7, the final SS-25 top kill attempt on December 22, 2015 [6] [7]. Kill modelling was not mentioned in the August 8, 2018, Examination Under Oath of Mr. Danny Walzel and Mr. James Kopecky [8] (pages SED 00635 – SED 00786). It is clearly stated in this document that Boot & Coots did not calculate the well flow rate which is a key variable needed for developing a kill plan (pages SED 00736 – SED 00737).

It appears from data provided to Blade that kill modeling was performed in preparation for kill attempt #7, unlike the lack of any modeling prior to the previous six kill attempts. But by this time the surface conditions had deteriorated from previous attempts and wellhead movement and safety concerns prevented the kill fluids from being pumped according the plan. Kill attempt #7 appeared to come close to killing the well, but it was terminated because of undesirable movement of the wellhead and pump lines that broke during the job. It is important to note that the kill attempt #7 fluid densities were similar to the results from the Blade transient kill models for the previous kill attempts.

d. If so, what is the factual basis for such a position?

As discussed in Question 1 c, modeling by itself cannot ensure a successful well kill.

e. Were the adjustments to kill operations that Mr. Abel mentions disclosed to Blade during its Root Cause Analysis?

Blade had access to historical kill data including:

- Some pre-job procedures
- SoCalGas daily operations reports
- Boots & Coots daily operations reports
- Halliburton post-job reports
- DOGGR daily operations summary reports

However, the rationale and the factors considered in designing the kill attempts were not made available to Blade.

The subject of kill modeling was raised many times with SoCalGas during the RCA. Multiple data requests were sent to SoCalGas regarding the kill attempts, rationale behind the kill attempts, and associated kill data. Consequently, Blade requested a discussion meeting and suggested the Boots & Coots personnel who were onsite and were associated with planning and executing the kill attempts join the discussion meeting [9]. Such a meeting never occurred.

f. If so, did Blade consider whether Boots & Coots appropriately considered all factors and made correct adjustments to its kill operations?

As discussed in the response to Question 1 e, the rationale for the well kill adjustments were not disclosed to Blade.

Although requested, Blade did not have direct access to the Boots & Coots personnel to determine if Boots & Coots appropriately considered all factors and made correct adjustments to its kill operations. Our review of the Boots & Coots well kill plans for attempts #2 – 6 did not document the rationale for the kill attempts. The 2018 Boots & Coots Examination Under Oath [8] did not have the details required to ascertain whether Boots & Coots considered all factors.

In Blade's view, kill attempt #7 had significant adjustments to the kill plan from previous kill attempts, and it was similar to the results of the Blade modeling.

g. Provide any documents and necessary additional context to support the answers provided.

Two documents were provided by SoCalGas to Blade that appear to be graphical results of kill modeling. These graphs appear to be generated within Schlumberger's *Drillbench* software. This is industry standard well control modeling software and the same software that Blade used in its kill analysis. Images of the documents are included in Figure 1 and Figure 2.

Figure 2 shows an AOF (absolute open flow) of 25 MMscf7/D and a gas flow rate of 15 MMscf/D. Blade estimated the well was flowing approximately 57 MMscf/D on December 22, 2015, [5] *SS-25 Well Nodal-Analysis with Uncontrolled Leak Estimation*, page 51. The final kill attempt #7 was pumped on December 22, 2015.

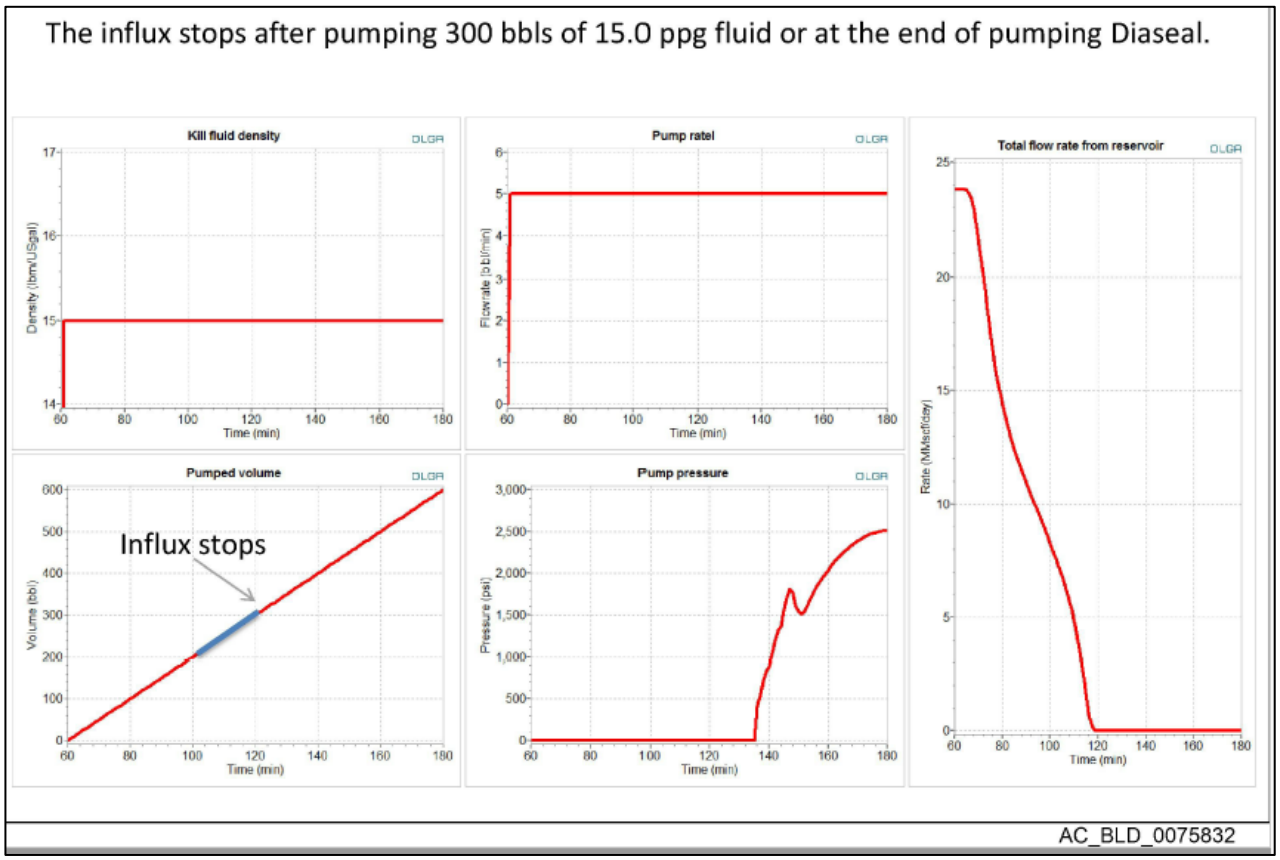

Figure 1: Kill Modeling Graphical Results

Snapshot of pumping 15.0 ppg WBM at the rate of 3 bpm

Basis of simulation:		Results:	
Reservoir pressure:	2,200 psi	Gas flow rate:	15 MMscfd
AOF:	25 MMscfd	Max pump pressure:	1,450 psi
SITP:	1,400 psi	Kill fluid volume:	65 bbls
Depth of exit point:	450 ft MD	Fracture occurs:	105 bbls
Restriction at exit point:	Yes	Top of fluid level in the annulus:	5,500 ft MD
Kill fluid density:	15.0 ppg		
Kill fluid viscosity:	25 cP		

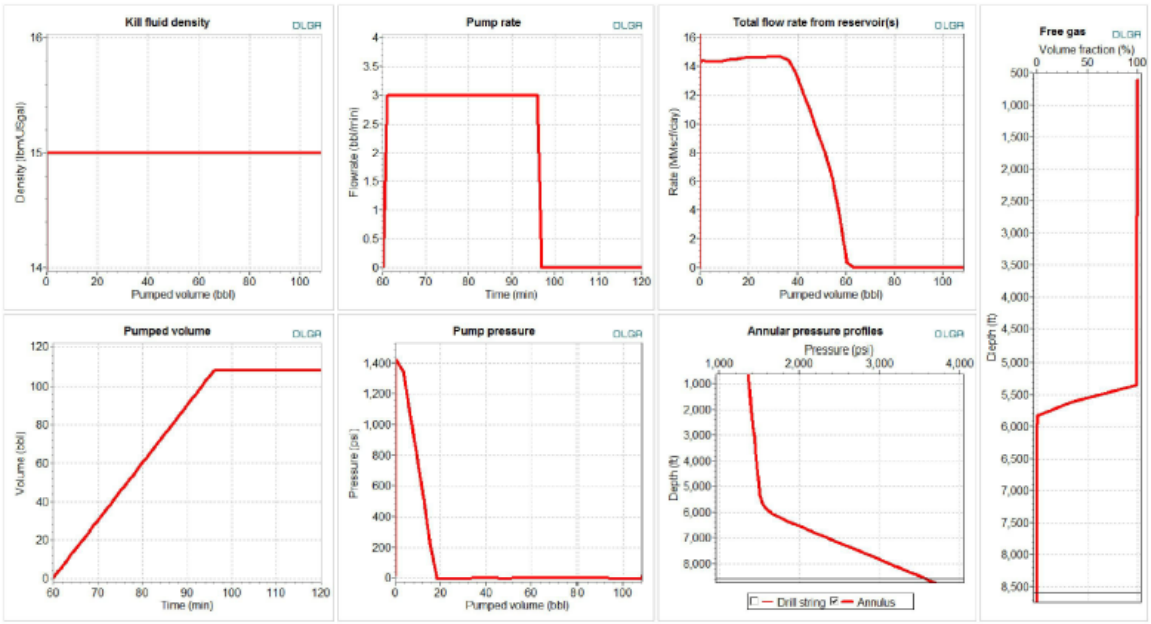

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Figure 2: Kill Modeling Graphical Results

2.2 Question 2

2. Please refer to the following passage on page 12 of Mr. Abel's testimony: Mr. Walzel testified that while the SS-25 wellhead equipment was rated to 5,000 PSI, given the unknown condition of the leak, Boots & Coots set a "safety limit" or "safety factor" well below the working pressure of the equipment. [Footnote omitted]. I believe that it was prudent for Boots & Coots to have set a safety factor so as not to risk damaging the wellhead." With this passage in mind, please answer:

2.2.1 Questions and Blade Responses

a. Does Blade's modeling consider risk to damaging the wellhead?

Yes. Blade considered the wellhead rated working pressure of 5,000 psi. The Blade kill simulations for all of the kill attempts resulted in a maximum predicted pump pressure of 3,644 psi for kill attempt #2 with decreasing maximum pump pressure for subsequent kill attempts because the reservoir pressure was declining with time. The maximum predicted pump pressure of 3,644 psi is below the "safety limit" set by Boots and Coots of 4,000 psi. The field was on withdrawal during the kill attempts so the reservoir pressure was dropping.

b. What is Blade's view as to whether this alleged "safety factor" below the working pressure of the equipment was prudent so as not to risk damaging the wellhead?

Blade agrees that it is prudent to use a safety factor to avoid damage to the wellhead and surface equipment. Blade's simulations showed that the wellhead pressures would not have exceeded 3,644 psi with the higher fluid densities. The model results honored the wellhead safety factor.

c. In Blade's view, given what could have been known about the condition of well SS-25 and other related factors by Boots & Coots at the time of its well kill attempts, could Boots & Coots have known whether the pump rate and fluid density it used was inadequate to kill well SS-25?

Yes, well kill modeling would have demonstrated that the pump rate and fluid density were inadequate to kill well SS-25.

Data were available on October 23, 2015, October 24, 2015 (when the first kill attempt was pumped), and November 8, 2015 (when a temperature, pressure, and spinner survey was run). These data could have been used for kill modeling to determine whether the planned kill attempt was likely to kill the well. A summary of the data available includes the following:

- October 23, 2015: The wellbore geometry was known, i.e., casing internal diameter, tubing outside and inside diameter, packer depth, ported mandrel with slots depth, perforations depth, etc. It could have been assumed that the flow path was from the perforations, up the casing, through the tubing to the ported mandrel slots, exit the slots, up the 7 in. casing × 2 7/8 in. tubing annulus until the flow exited the 7 in. casing leak into the surface casing × production casing annulus. The tubing was shut in at surface diverting the flow up the annulus. The gas at surface during kill attempt #1 indicated the leak was shallow enough to broach to surface. The flowing casing pressure of approximately 270 psi on October 23, 2015, gave information on the back pressure the leak was flowing against without needing to know the exact flow path of the gas to surface.
- October 23, 2015: The reservoir pressure was available from the pressure monitoring well SS-5 and the historical SS-25 well test data were available. As described in the Blade Report [1] pages 127 – 134, the well test data could have been used to determine the well deliverability based on the bottom hole pressure (BHP) to estimate the gas flow rate. The flow rate decreased with time because the field was being produced to reduce the BHP.
- October 23, 2015: While the size of the hole in the casing was unknown, the area of the casing × tubing annulus cross section could have been used as the size of the hole in the casing as a worst case (which in fact turned out to be correct because the 7 in. casing was parted).
- October 24, 2015: Kill attempt #1 reported gas at surface after pumping 89 bbl of fluid down the casing. This indicated a shallow leak as documented in the SoCalGas SS-25 daily report for October 24, 2015 [2] "At this time, It appears that we had a wellhead seal leak and/or a very shallow 7" production casing leak."
- November 8, 2015: A production log survey [3] (temperature, pressure, and spinner) was run and it showed cooling anomalies at approximately 365 ft and at 890 ft. Assumptions for modeling could have used these two depths as possible leak depths. The analysis from the temperature survey was dated November 12, 2015. As it turned out the leak was at 892 ft, the lower temperature anomaly depth. Blade modeled a leak at 440 ft and determined the

parameters to kill the well at a 440 ft leak were approximately the same as a leak at 892 ft [10] SS-25 Transient Well Kill Analysis, page 35.

- November 13, 2015: Junk shots were pumped during kill attempt #2. After 5 bbl of brine was pumped down the annulus, brine was observed from the fissures (Add Energy Report [4], page 89).

Blade believes that kill modeling using the well data described in Question 2 c. would have shown that the reported fluids pumped (volume, density, and rate) during kill attempts #2 through 6 would not have killed the well. A summary of the Blade analysis of the actual kill attempts are included in a supplementary report [10] *SS-25 Transient Well Kill Analysis*, page 20.

2.3 Question 3

3. Please refer to the following passage on page 13 of Mr. Abel's testimony, "Further, Boots & Coots' pumping operations were implemented not only in consideration of the pressure rating of the surface equipment, but also based on observation of the wellhead's physical response to pumping operations. Mr. Walzel described that during certain pumping operations, the SS-25 wellhead was "moving around a lot," which at times caused Boots & Coots to slow or stop pumping operations an [sic], in one case, broke the flow lines on the 7 inch tubing and casing, and the nipple on the wellhead. [Footnote omitted] While it does not appear that Blade's modeling accounted for these safety considerations, Boots & Coots appropriately tailored its kill operations—in real-time—to limit the potential risk of further damaging the well and compromising safety."

2.3.1 Questions and Blade Responses

a. Does Blade agree that Blade's modeling did not account for the considerations such as those identified above?

Blade's modeling assumed the fluids would be pumped at the rates, volumes, and density that would kill the well according to the kill modeling. It should be noted that any interruption in the planned pumping schedule such as slowing or stopping pumping will likely result in an unsuccessful kill attempt. Modeling results are the basis of pre-job planning. Safety considerations encountered during the kill attempts may interrupt and abort an attempt. However, the usage of heavier fluids, planned using the modeling results, may have reduced the well head movement.

Although requested, Blade did not have direct access to the Boots & Coots personnel to determine what Boots & Coots had considered and the rationale for kill operations. The 2018 Boots & Coots Examination Under Oath [8] did not have the details required to ascertain whether Boots & Coots considered all factors.

b. If not, did SoCalGas provide Blade with this information when Blade was doing its Root Cause Analysis?

Information that Boots & Coots appropriately tailored its kill operations—in real-time—to limit the potential risk of further damaging the well and compromising safety was not provided to Blade. As discussed in Question 1 e., Blade requested data regarding kill planning, modeling, and operations many times, but such data were not provided.

Safety considerations always take precedence when carrying out the field operations. The planning of a kill operation includes the modeling results to know how to plan the equipment, the personnel, the physical layout, and the fluids for the field operations. Safety considerations are

normally discussed at the pre-job meeting in the field. While the pumping is underway, changes in the plan can occur if things are not going according the plan or if there is a reason to change the operation because of a safety consideration. Events like wellhead movement and broken lines are reasons why the pumping plan could change.

It also needs to be pointed out that the modeling is based on an assumed pump rate and fluid density to maintain a bottom hole pressure because of fluid friction and, if the pump rate is reduced or stopped, the loss of friction pressure may allow the well to start flowing again. If this happens, the kill attempt is likely to be unsuccessful. The well, surface equipment, and pumping equipment need to be in a condition that allows the pumping operation to continue without interruption to have a chance of a successful kill. A review of data from kill attempts #2 through 6 reported no indications that safety issues would have compromised the ability to kill the well with heavier fluids at the pump rates resulting from the Blade modeling.

This shows the importance of using kill modeling, which considers the normal variables and accounts for other limitations, to provide results that maximize the chances of success to kill the well on the first attempt. The well and surface conditions are usually going to be the best for the earlier kill attempts.

c. If not, did Blade provide SoCalGas with the opportunity to provide Blade with this information when Blade was doing its Root Cause Analysis?

Blade made multiple data requests for data related to kill operations and kill modeling in addition to a request for a face-to-face meeting with the Boots & Coots personnel with first-hand knowledge of the SS-25 kill operations. A meeting with Blade and Boots & Coots could not be arranged. This was discussed in Question 1 e.

d. Provide any context necessary in support of these answers.

Blade data requests to SoCalGas related to killing the SS-25 well includes the following:

- Data Request February 11, 2016 [11]
- Data Request May 4, 2016 [12]
- Data Request June 29, 2018 [13]
- Data Request August 29, 2018 [14]
- Data Request October 26, 2018 [15]
- Data Request December 19, 2018 [9]
- Data Request January 2, 2019 [16]

2.4 Question 4

4. Please refer to the following passage on page 13 of Mr. Abel's testimony: "Second, Blade had the benefit of gathering more precise data points that were not available to Boots & Coots while planning, modeling, and executing its well kill attempts: 1) the precise depth and severity of damage to the production casing, and 2) the flow path of the gas from the 7" casing leak to the surface. Indeed, computer modeling is sensitive to the well geometry (i.e., leak depth, severity, and flow path), which means that more precise information will produce more accurate modeling outputs. However, precise flow path geometry is typically unavailable during an active leak response. . .While Blade was able to determine that the production casing had completely parted 892 feet after extracting and examining the

7" casing, Boots & Coots could only estimate the flow path geometry based on real-time observation and analysis of pumping operations. Second, after extracting the 7" casing, Blade had the advantage of using a video camera to analyze the 11-3/4" casing an observe holes—which Blade determined were the "likely consequence of the axial rupture" of the 7" casing. [Footnote omitted.]. The existence of holes in the surface casing is significant because it impacts the flow path of the leak and, in turn, the accuracy of the transient modeling. Accordingly, while Blade was able to extract the 7" casing to gather additional data to incorporate into its modeling, Boots & Coots could not have done the same. The practical impact of this disparity in information is that Blade's modeling was refined by additional data points that were not available to Boots & Coots." With this passage in mind, please answer.

2.4.1 Questions and Blade Responses

a. Does Blade agree that each of the points raised in this passage were available to Blade, but Boots & Coots could not have gathered such information at the time it was attempting the well kills of SS-25?

No.

b. If not, which data points does Blade view that Boots & Coots could have attained?

Assumptions regarding the leak path and leak depth were made within a few days of the leak event on October 23, 2015, and likely within hours because a wellbore schematic (WBS) with well details information was needed for kill planning. Examples of the evolution of wellbore schematics prepared post October 23, 2015, include wellbore schematics from SoCalGas, a Boots & Coots WBS from a December 16, 2015, presentation, a WBS from an Add Energy Report released in February, 2016, (work done prior to February), and a Blade WBS with final data. Log surveys run on November 8, 2015, were also available that indicated possible leak depths. A review of these documents shows there were no material changes to the leak path and there would be no impact on modeling results. Refer to Figure 3 through Figure 8.

Precise data of the leak location and leak path were not needed for transient kill modeling.

Figure 3 shows a rough sketch of SS-25 with an indication of the leak flow path to surface [17] (page 79, AC_CPUC_0000101). Figure 4 shows more details of the suspected gas flow path. The sketches indicate a leak in the 7 in. production casing with the leak path outside the 11 3/4 in. casing to surface [18].

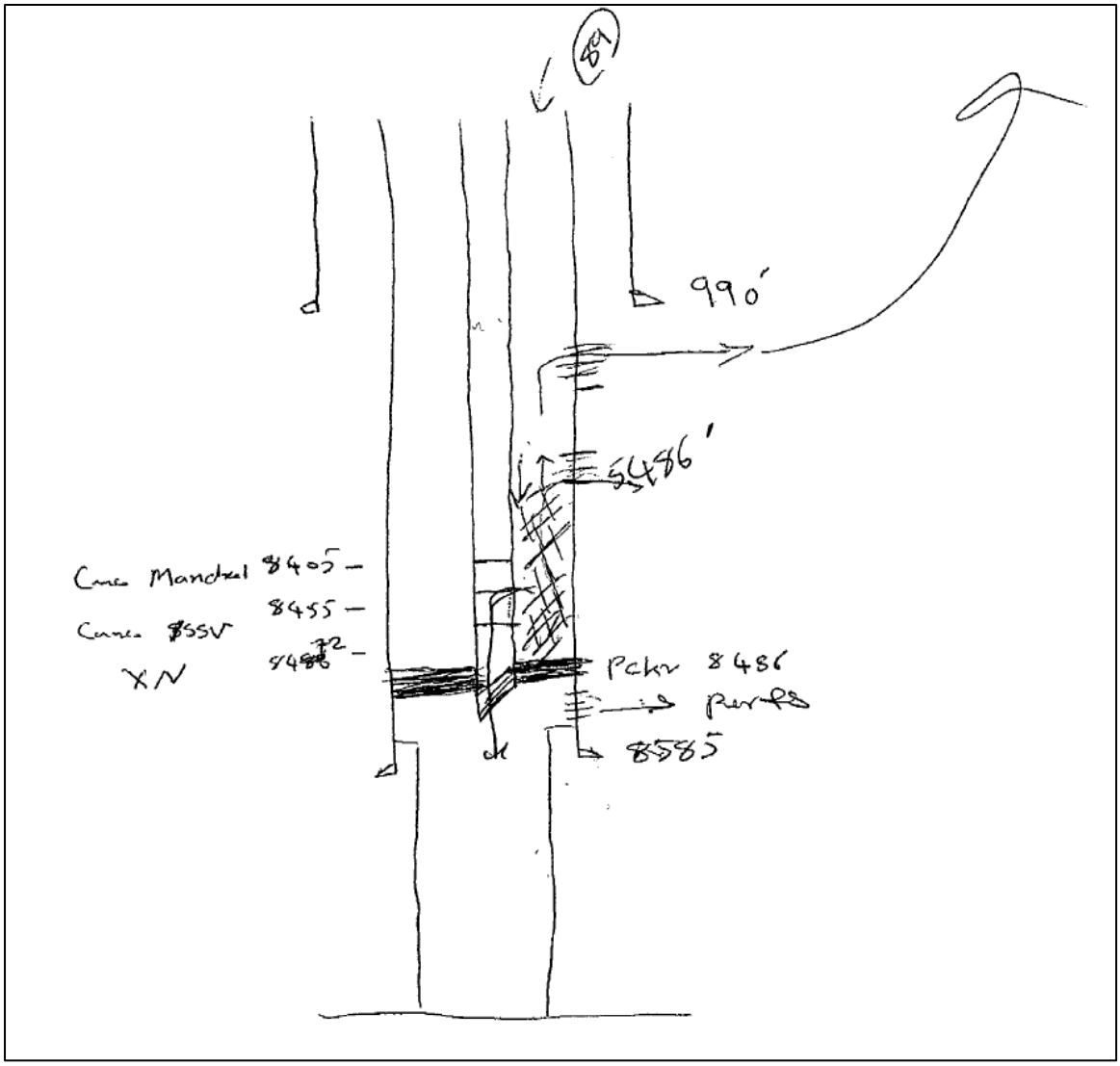

Figure 3: SoCalGas Wellbore Schematic of SS-25 (circa October 24, 2015)

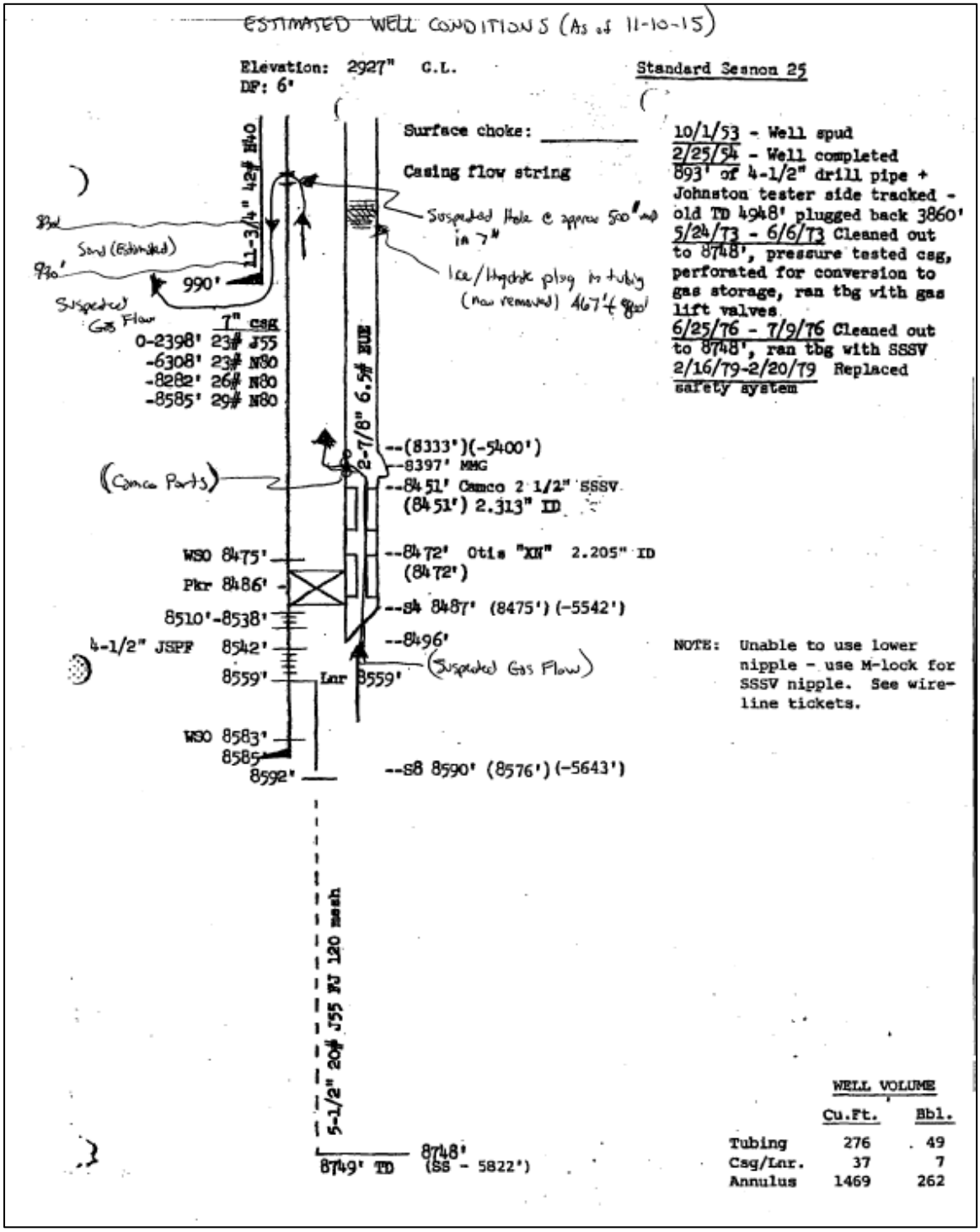

Figure 4: SoCalGas Wellbore Schematic of SS-25 (November 10, 2015)

On November 8, 2015, a production log including temperature, pressure, and spinner surveys was run [3]. It showed temperature anomalies with comments and a possible leak depth at 890 ft near the 11 3/4 in. shoe depth (Figure 5). The leak depth turned out to be correct and was confirmed when the casing was recovered.

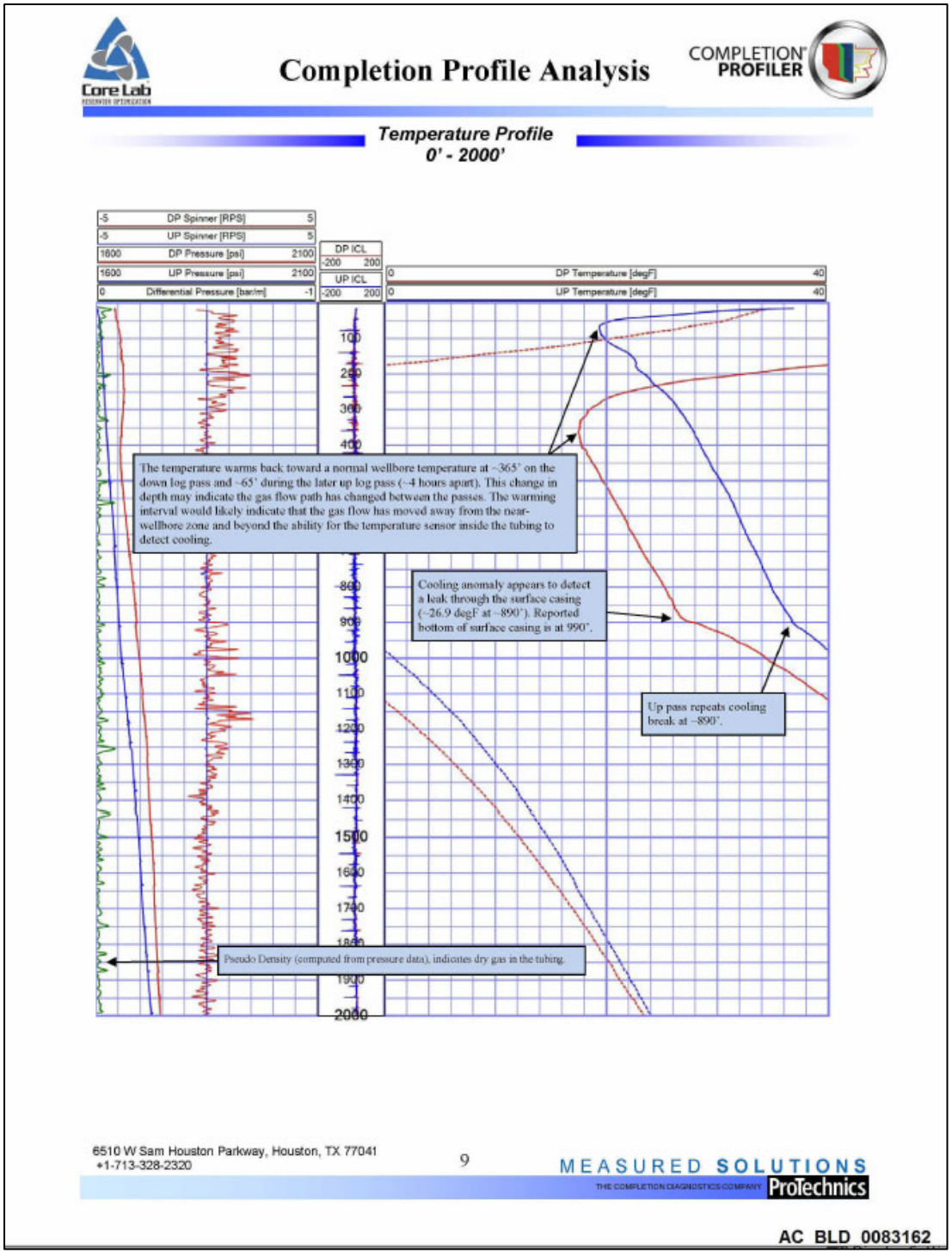

Figure 5: Temperature Profile (November 8, 2015)

Figure 7 shows the Boots & Coots version of the WBS with gas flow paths from a presentation dated December 16, 2015 [19].

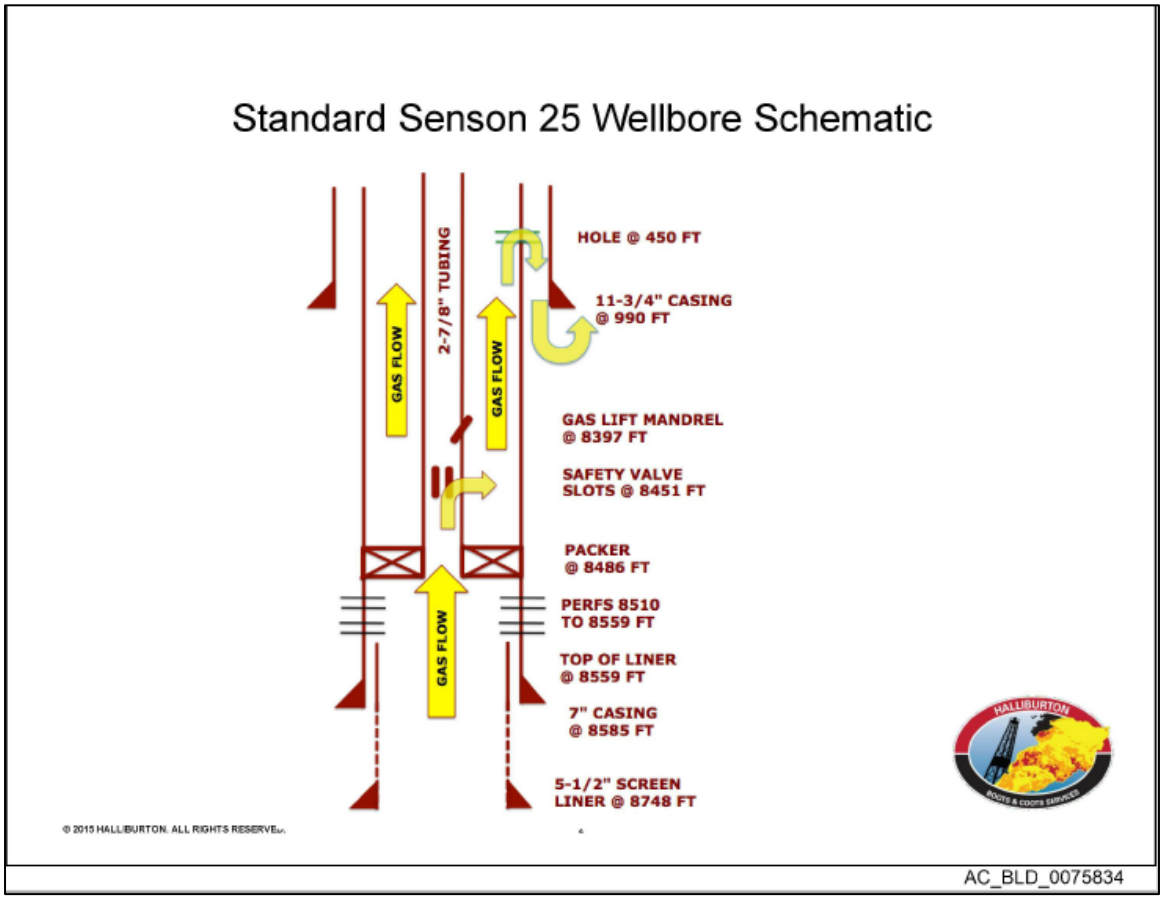

Figure 6: Boots & Coots Wellbore Schematic (December 16, 2015)

Figure 7 shows the WBS from the Add Energy Report released in February 2016 [4] (page 34, AC_BLD_0031337). The gas flow paths are indicated by the red arrows. A leak depth at 440 ft was estimated by Add Energy.

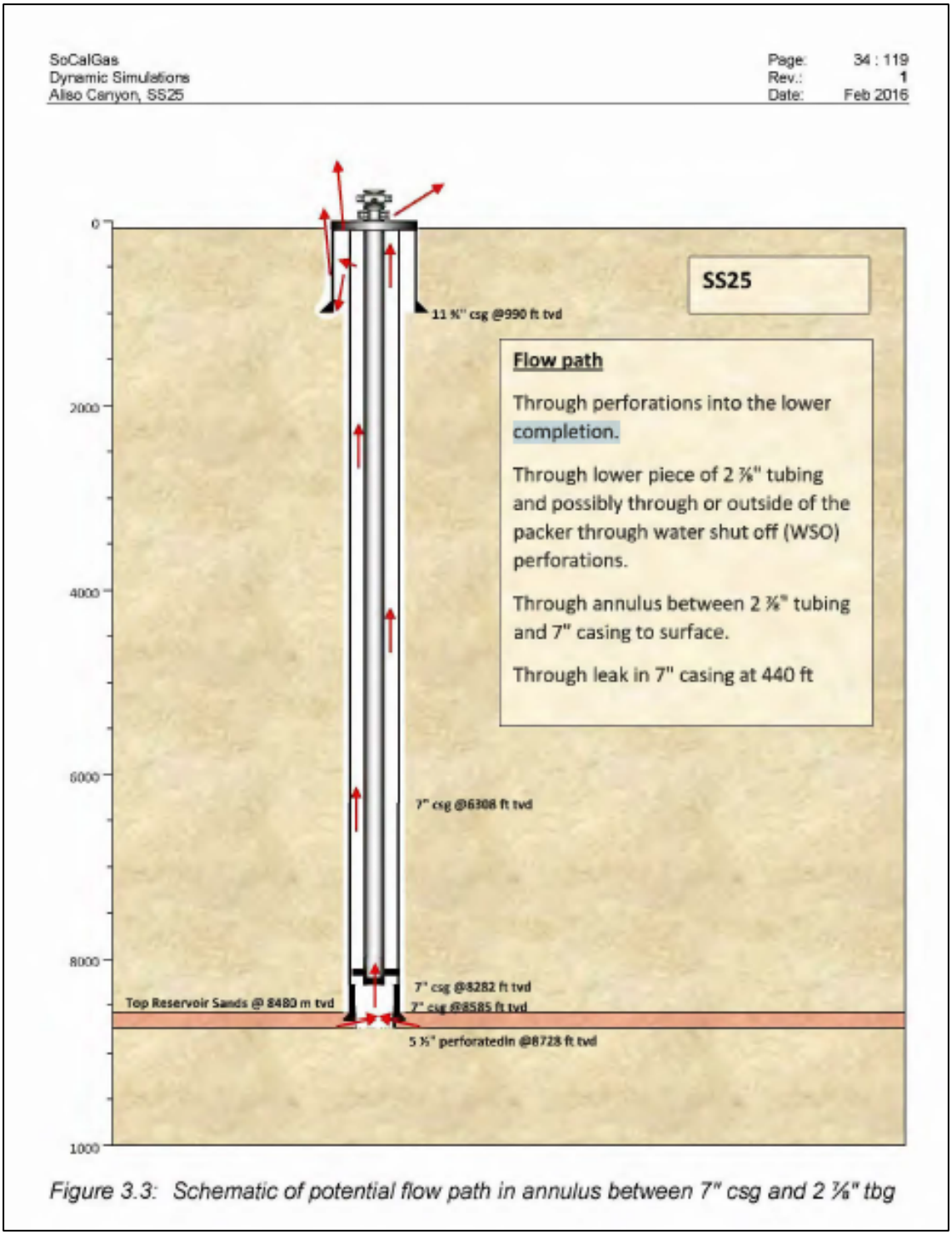

Figure 7: Add Energy Wellbore Schematic

Figure 8 shows the WBS for SS-25 prepared by Blade with the parted 7 in. casing at 892 ft.

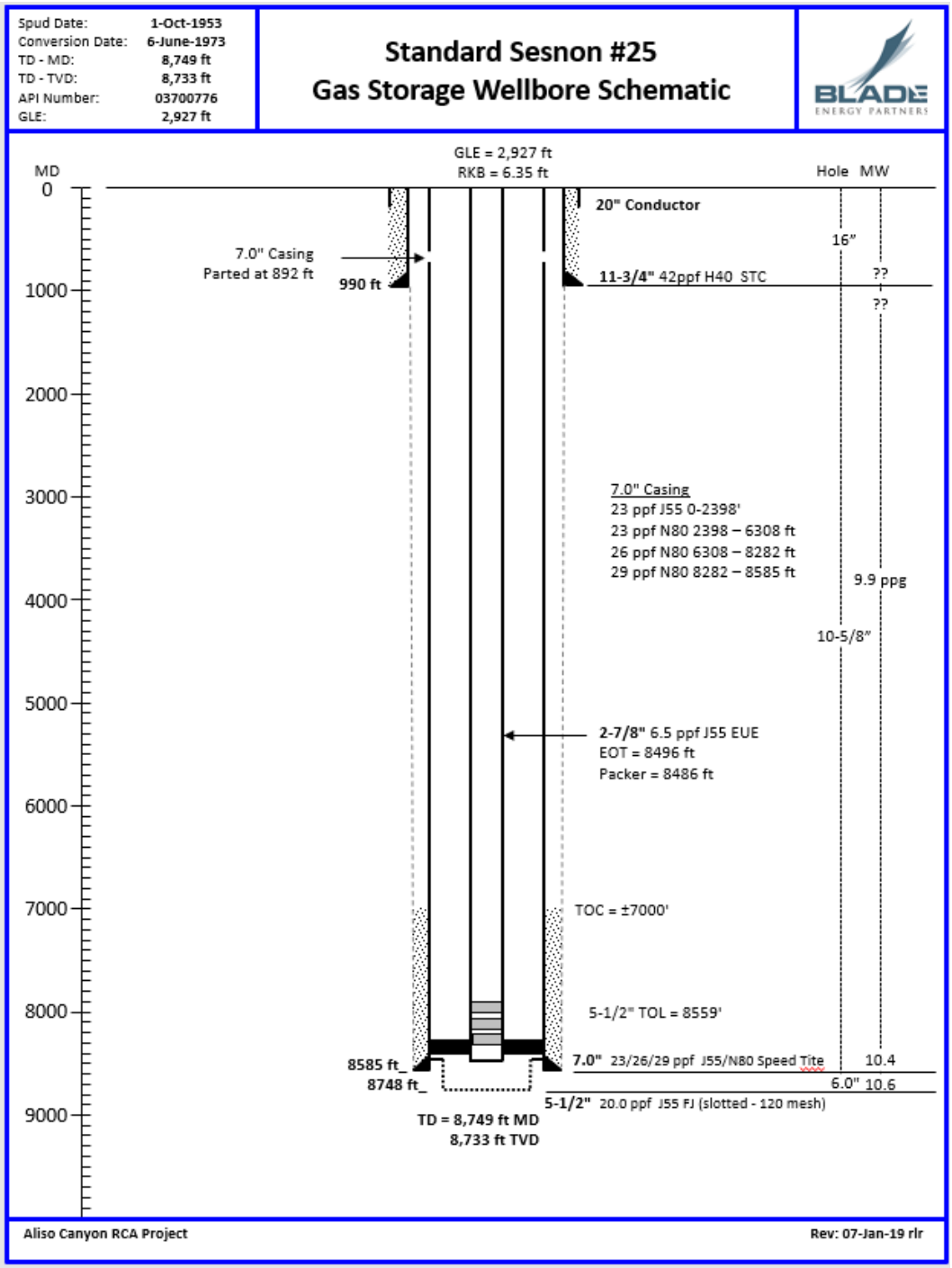

Figure 8: Blade Wellbore Schematic

An estimate of the depth of the leak was available from the temperature survey run on November 8, 2015 [3]. The survey showed temperature anomalies at 890 ft and 365 ft (Figure 5). Blade modeling shows flow from either depth resulted in no change in the pump rate and fluid density required to kill the well [10] *SS-25 Transient Well Kill Analysis*, page 35. The severity of the leak could have been assumed as the cross-sectional area of the casing × tubing annulus which turned

out to be correct with parted 7 in. casing. The flow path pressure restriction from the leak to surface was inferred by Blade based on the 7 in. casing surface flowing pressure of approximately 270 psi on October 23, 2015. The 7 in. casing flowing pressure takes into account the restrictions in the flow path to surface and the holes in the surface casing were not relevant.

The holes in the 11 3/4 in. casing were discovered in August 2018 after the 7 in. casing was extracted. The majority of the Blade kill modeling was done in 2016, some two years before the holes were discovered. The Blade kill modeling has never considered the holes in the 11 3/4 in. casing directly. The effect of the holes on the flow and pressure from the leak depth to surface is accounted for in the flowing casing pressure. The flowing casing pressure was known at the time of the event on October 23, 2015. Knowing the existence of the 11 3/4 in. holes was not relevant and was immaterial for the modeling.

The Add Energy Report [4] in 2016, had correctly predicted the flow path, ". . . the pressure in the outer annulus reached the fracture pressure of the 11 3/4" casing shoe with the consequence that flow paths were created outside of this casing to surface." (Add Energy Report page 9, AC_BLD_0031312) In the absence of any additional data, Add Energy had a near correct interpretation of the leak path, leak rates, and even the complexities of the hydrates forming. The Add Energy Report includes a discussion of potential flow paths (page 32, AC_BLD_0031335) where a possible shallow hole in the 11 3/4 in. casing is mentioned two times. Add Energy didn't have any of the benefits that Blade had with the actual physical failure, subsequent inspection and temperature logging data, nor any downhole video camera data. Notably, Add Energy estimated a flow rate 80 MMSCF/d at the time of the first kill attempt; they stated the methodology as, "(This estimated flow rate is not dependent of the flow path from the bottom of the tubing to surface, but only calculated based on pressures and the inflow performance relation (IPR) estimated from well tests)." (Add Energy Report page 7, AC_BLD_0031310). Add Energy's findings were not groundbreaking academic research but were an obvious extensions of industry standard modeling. Further, the Add Energy Report also assumed a shallow 7 in. casing leak location.

The knowledge of the exact 7 in. casing leak location and the presence of 11 3/4 in. holes does not impact the modeling. All of the required data was available during the kill attempts to conduct such modeling.

c. If Blade lists an answer to question 4b, explain why Boots & Coots could have attained these data points.

A key parameter required for kill modeling with realistic results, not mentioned in the passage, is the SS-25 gas flow rate. The gas flow rate, and the other data mentioned in Question 4 b. were available with reasonable certainty to conduct kill modeling. The data needed for modeling, including the estimate of the gas flow rate, a key parameter for kill modeling, are discussed in detail in response to Question 2 c.

d. In Blade's view, with the data that Boots & Coots had at the time it was attempting to kill well SS-25, could Boots & Coots successfully have killed well SS-25?

Yes, assuming that available data and reasonable assumptions had been used for the kill modeling (and assuming that the pumping was carried out according to plan developed through modeling), Boots & Coots could likely have killed SS-25. By "reasonable" we mean that assumptions were made based on engineering analysis, experience, and judgment. In addition, uncertainties in the input data should have been evaluated using the modeling to determine the sensitivities to a

given parameter. Conservative assumptions are normally made in designing kill plans to improve the chances for a successful outcome.

Blade evaluated each kill attempt using reasonable assumptions of bottom hole pressure and gas flow rate and modeling showed the well could have been killed with 12 ppg or 15 ppg drilling fluid pumped between 5 and 10 bpm depending on the specific kill attempt. The bottom hole pressure was changing with time, correspondingly, the kill parameters changed. Details of the kill scenarios are included in the Blade supplementary report *SS-25 Transient Well Kill Analysis* [10] (pages 27 – 31).

The Blade modeling planned killing the well with weighted drilling fluid which is better suited to prevent gas migration and leak-off into the formation than the low-density clear fluid that was used in kill attempts #2 – 6. Boots & Coots used 15 ppg drilling fluid in the final kill attempt #7 which was consistent with the Blade modeling results. This is discussed in the supplementary report SS-25 Transient Well Kill Analysis [10] (page 38).

e. If so, on which attempt?

Kill attempt #2 (the first Boots & Coots attempt) or kill attempt #3 were possible to achieve a successful kill assuming proper modeling was done with valid input data and a successful pumping operation according to the modeling results. This is discussed in the Blade Report [1] (page 4). A pumping operation with no interruptions is extremely important to prevent the well from flowing once it was killed during the kill operation. If the pumping fluid friction pressure is lost or reduced during the kill operation, the kill attempt will likely fail. It should be noted that operational uncertainties are not accounted for in modeling.

f. If the answer to Question 4 d is yes, why?

The well and site were in the best condition of all of the kill attempts for kill attempt #2. However, the SoCalGas November 13, 2015, daily report [2] shows there was a pump shut down during the job which interrupted the planned kill operation and resulted in an unsuccessful kill attempt.

Unfortunately, the surface conditions deteriorated during and after kill attempt #2. A quote from a DOGGR report [20] describes the damage caused by the kill attempt.

> Overall, this was the day that the well actually blew out in the conventional sense. Previously, it was not clear that the well was in a blowout situation. But after this pumping job, a blowout vent opened 20' from the wellbore and began shooting debris 75' into the air.

g. In Blade's view, with the data that Boots & Coots had and could have attained at the time it was attempting to kill well SS-25, could Boots & Coots successfully have killed well SS-25?

See Question 4 d.

h. If so, on which attempt?

See Question 4 e.

i. If the answer to question g is yes, why?

See Question 4 f.

2.5 Question 5

5. Please refer to the following passage of page 14 of Mr. Abel's testimony.

Lastly, Blade's model disregarded other key variables in pertinent well control operations. Blade's primary design variables were fluid density and pump rate. Other parameters such as viscosity, fluid stability, availability, and toxicity must also be considered. Further, not only must a kill operation stop the gas flow, the well must be stable when the kill fluid column is in a static state (i.e., after pumping stops). The pressure profile and corresponding tubular and wellbore integrity (which changes with depth) must also be considered and not exceeded. Because the Blade Report did not analyze these additional parameters, it is unknown if the fluid characteristics proposed by Blade (and alleged by SED) would have killed the well.

With this passage in mind, please answer:

2.5.1 Questions and Blade Responses

a. Does Blade agree that its model disregarded other key variables in pertinent well control operations?

No.

b. Why or why not?

The parameters fluid stability, availability, and toxicity are not input data to a kill model. Blade used fluid viscosity in the modeling analysis. Fluid viscosity is an important parameter used to estimate the friction pressure calculations which affect the pressure profile in the fluid flow path in the wellbore and the surface pump pressure.

c. Provide additional context and facts as necessary.

Fluid stability is important to ensure the solids in the weighted kill fluid (drilling fluid) remain suspended when the fluid is static. This would be a requirement that would be part of the specifications and requirements communicated to the supplier of the kill fluid when the fluid is ordered. The fluid properties would be confirmed before the fluid was pumped to ensure stability and other properties. This is a common requirement when dealing with fluids where the density is controlled by adding solids to the fluid.

Fluids with the proper density and flow properties are available from numerous suppliers. The kill fluids being discussed are also referred to as drilling fluid and are commonly used in oilfield drilling and workover operations. The fluid used by Boots & Coots in kill attempt #7 was 15 ppg water-based fluid that was procured and made available for the kill attempt. Blade identified similar densities for fluids for kill #2 through #6. A well kill model would have revealed that 12 ppg or 15 ppg fluid could have been used earlier in the kill attempts. As discussed in Question 4 d, using a drilling fluid as the kill fluid has several advantages over a clear fluid related to preventing gas migration and fluid leak-off into the formation.

Boots & Coots pumped barite pills as part of kill attempts #3, 4, and 5. However, because the well was not killed, the gas flow prevented the barite from settling and forming a competent plug or bridge in the annulus. A barite pill needs several hours in a static condition to settle.

It is not clear why toxicity is mentioned. It is not something that affects the modeling or the killing operations. Water-based fluids are commonly made up of non-toxic materials and there would be no reason to include toxic materials in a kill fluid.

d. Does Blade agree that "it is unknown if the fluid characteristics proposed by Blade (and alleged by SED) would have killed the well?

Yes, because the fluid characteristics along with the fluid densities and pump rates modeled by Blade were not used in a kill attempt and operational uncertainties are not reflected in modeling.

e. Why or why not?

The main parameter of the fluid used to kill a well is density with sufficient additives to maintain a stable fluid at surface and downhole conditions. The fluids proposed based on the Blade modeling included water-based fluids with 12 ppg or 15 ppg density and are standard-commonly available fluids with known flow properties.

f. Provide additional context and facts as necessary.

Not only are the fluid characteristics important; as discussed, the requirement for a successful well kill is to determine the fluid density and pump rate required to kill the well by stopping the influx of gas and then pumping the kill fluid in the same manner that it was modeled. If there are interruptions in the pumping, the kill is likely to be unsuccessful.

2.6 Question 6

6. Please refer to the following passage of pages 14 and 15 of Mr. Abel's testimony.

In sum, Blade's post-hoc transient modeling was an academic exercise that cannot fairly be compared to Boots & Coots' task of working on site under real-time constraints, and dealing with practical, field-level concerns (e.g., severe weather, wellhead condition, and safety of personnel). Even assuming Blade's transient modeling generated reasonable outputs, there is no basis for SED to claim that Boots & Coots should have killed SS-25 sooner—particularly as early as the second attempt (on November 13, approximately 3 weeks after the leak commenced)—when Blade needed 5-6 weeks to model a well kill, [Footnote omitted] not including time spent on the investigation and casing removal. Boots & Coots' approach of increasing pump rate and fluid density over well kill attempts 2 through 7 reflects a measured and logical process that did not compromise the safety in the process of bringing the well under control.

With this passage in mind, please answer:

2.6.1 Questions and Blade Responses

a. Does Blade view that its transient modeling generated reasonable outputs?

Yes.

b. Why?

Blade used available data (as described in the response to Question 2 c.) to construct its model. This model demonstrated that the well could be killed using 12 ppg or 15 ppg fluids pumped at reasonable rates.

c. Does Blade maintain that there is a basis for the claim that Boots & Coots should have killed SS-25 sooner?

Blade is not in a position to determine if Boots & Coots should have killed SS-25 sooner.

d. Why or why not?

As discussed previously, there are two components of a well kill required to result in a successful outcome. The first is a plan based on available data and reasonable assumptions if data is not available. Blade contends that because of the obvious complexity of the well control situation, kill

modeling was needed to develop a plan that maximized the chances of a successful kill. The second part is implementation of the pumping operations in the field. The fluid density and fluid pump rate have to match or exceed the plan and pumping must be completed without interruptions. When both components are done correctly, there is a good chance the kill will be successful. If either component is not right, a failed kill attempt is likely.

e. Does Blade maintain that there is a basis for the claim that Boots & Coots should have killed SS-25 as early as the second attempt, even if Blade needed 5 to 6 weeks to model a well kill (excluding investigation and casing removal time)?

The statement that Blade needed 5 to 6 weeks to model a well kill was taken out of context.

The accurate statement is "So for us [Blade] it took much longer; four, five, six weeks to analyze all of the seven kills." [21] (page 1058:14 – 16). Blade modeling included a detailed assessment of gas flowrates and history matching. This level of accuracy was not required for kill modeling prior to kill attempts.

Blade believes that more accurate kill modeling, using data available as early as the second kill attempt, would have led to a better well kill plan. Such modeling would have taken less than a week to complete. *Drillbench* software is intended to be used prior to well kill operations. A properly designed well kill plan, if implemented correctly, would have increased the chances of success. However, operational uncertainties are not reflected in modeling.

f. Why or why not?

See Question 6 d.

g. Even if Blade needed 5 to 6 weeks to model a well kill, does Blade maintain that Boots & Coots needed that long to do its own transient modeling at the time of the SS-25 incident?

No and again, the statement that Blade needed 5 to 6 weeks to model a well kill was taken out of context as discussed in Question 6 e.

h. Why or why not?

Blade is not in a position to know how long it would take Boots & Coots to do transient modeling. However, for engineers familiar with the *Drillbench* software could conduct such analysis with reasonable assumptions within a few days.

The data obtained by Blade for modeling was collected through numerous data requests over an extended time period.

i. Does Blade agree that Boots & Coots approach of increasing pump rate and fluid density over well kill attempts 2 through 7 reflects a measured and logical process that did not compromise the safety in the process of bringing the well under control?

Not necessarily.

j. If Blade disagrees with any portion of Mr. Abel's statement mentioned in question 6i, please identify each such portion.

Blade disagrees with the following portions of Mr. Abel's statement:

- "In sum, Blade's post-hoc transient modeling was an academic exercise that cannot fairly be compared to Boots & Coots' task of working on site under real-time constraints, and

dealing with practical, field-level concerns (e.g., severe weather, wellhead condition, and safety of personnel)."

- "Even assuming Blade's transient modeling generated reasonable outputs, there is no basis for SED to claim that Boots & Coots should have killed SS-25 sooner—particularly as early as the second attempt (on November 13, approximately 3 weeks after the leak commenced)—when Blade needed 5-6 weeks to model a well kill, [Footnote omitted] not including time spent on the investigation and casing removal."
- "Boots & Coots' approach of increasing pump rate and fluid density over well kill attempts 2 through 7 reflects a measured and logical process that did not compromise the safety in the process of bringing the well under control."

k. Please explain why Blade disagrees with each portion of Mr. Abel's statement identified in response to Question 6 j.

For the first bullet point of Question 6 j., see our answers to Question 1 b.

For the second bullet point of Question 6 j., see our answers to Question 6 e.

For the third bullet point of Question 6 j., our answer is as follows:

Based on kill attempt data and reports provided to Blade, the fluid density did not increase during kill attempts #2 through 6. The majority of the kill fluid pumped was 9.4 ppg brine and 8.34 ppg fresh water with some 18 ppg barite pills. This assertion is supported by Mr. Walzel with Boots & Coots. He stated ". . . I think the fluid weights stayed the same." in the *SED CPUC Opening Testimony Supporting Attachments* document [8] (page SED 00717:18 – 19). The fluid density did increase to 15 ppg for kill attempt #7. The data does show the pump rate increased from 8 to 9 bpm for kill attempts #2, 3, and 4 to 13 bpm for kill attempts #5 and 6. The pump rate for kill attempt #7 was 5.8 bpm.

As discussed in the Blade Report [1] (page 4), "Based on the data reviewed by Blade, the well-control company appeared to have designed the kill attempts solely by calculating a kill fluid density that was higher than the static bottom hole pressure." The result was that the well was not killed and the surface conditions continued to deteriorate. The well was brought under control in February 2016 from the relief well, not from top kill attempts in November and December of 2015.

l. Provide additional context and facts in support of the question 6 responses as necessary.

Not applicable. See the discussion in Question 6 a – k responses.

3 References

[1] Blade Energy Partners, "Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon SS-25," 2019.

[2] SoCalGas, "Daily Report 10-23-2015 thru 11-15-2015.pdf," 2015.

[3] SoCalGas, "SS-25 Completion Profiler, AC_BLD_0083154.pdf," 2015.

[4] Add Energy, "Dynamic Simulations Aliso Canyon SS25, AC_BLD_003304-AC_BLD_0031422, February 16, 2016 (C042 AC_BLD_0031304 Optimized Add Energy.pdf)".

[5] Blade Energy Partners, "SS-25 Well Nodal-Analysis with Uncontrolled Leak Estimation RCA Report Volume 3 - Post-SS-25 Leak Events.pdf," 2019.

[6] Unknown, "Kill Attempt Modeling, AC_BLD_0075832, (no date) (AC_BLD_0075832.pdf)".

[7] Unknown, "Kill Attempt Modeling, AC_BLD_0075853, (no date) (AC_BLD_0075853.pdf)".

[8] SED California Public Utilities Commission, "I1906016 (PUBLIC) SED Opening Testimony - Supporting Attachments.pdf".

[9] Blade Energy Partners, "Data Request December 19, 2018 (Request for Factual Data Verification Discussion December 19th, 2018-Boots_Coots.pdf)," 2018.

[10] Blade Energy Partners, "SS-25 Transient Well Kill Analysis RCA Report Volume 3 - Post-SS-25 Leak Events.pdf," 2019.

[11] Blade Energy Partners, "B012 RCA Info Request to SoCalGas, February 11th 2016.pdf," 2016.

[12] Blade Energy Partners, "B064 RCA Info Request to SoCalGas, May 4th 2016_additional kill data from SS25.pdf," 2016.

[13] Blade Energy Partners, "Request for Factual Data Verification Discussion June 29th, 2018.pdf," 2018.

[14] Blade Energy Partners, "RCA Follow-up Request to SoCalGas, August 29th 2018 Factual Meeting followup-1.pdf," 2018.

[15] Blade Energy Partners, "RCA Info Request to SoCalGas, October 26, 2018.pdf," 2018.

[16] Blade Energy Partners, "RCA Info Request to SoCalGas, January 2, 2019 final.pdf," 2019.

[17] SoCalGas, "SS-25 Well Documentation (from SoCalGas)_N.pdf".

[18] SoCalGas, "SS-25 Well Schematic_11-10-15.pdf," 2015.

[19] Boots & Coots, "Boots and Coots Presentation Dec 16 2015 AC_BLD_0075833.pdf," 2015.

[20] Division of Oil, Gas, and Geothermal Resources, "SS-25 Chronology Summary (STANDARD SESNON 25 Chronology Summary-1 from DOGGR.docx)".

[21] "Porter Ranch - FULL Deposition Transcript of Ravi M. Krishnamurthy, Ph. D., Vol. III, on 11-22-19 with EXHIBITS (00550786xBCD99).PDF," 2019.

CHAPTER 4
EXHIBITS

Michael G. Romey
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LATHAM&WATKINS LLP

FIRM / AFFILIATE OFFICES
Abu Dhabi, Barcelona, Beijing, Boston, Brussels, Century City, Chicago, Dubai, Düsseldorf, Frankfurt, Hamburg, Hong Kong, Houston, London, Los Angeles, Madrid, Milan, Moscow, Munich, New Jersey, New York, Orange County, Paris, Riyadh, Rome, San Diego, San Francisco, Shanghai, Silicon Valley, Singapore, Tokyo, Washington, D.C.

November 12, 2015

File No. 026882-0321

VIA ELECTRONIC MAIL

Leonardo Portillo
Boots & Coots
Email Address: lportillo@boots-coots.com

Re: Aliso Canyon Storage Facility Leak Response

Dear Mr. Portillo:

As you know, Boots & Coots ("B&C") has been retained to assist the Southern California Gas Company ("SoCalGas") in its response to the gas leak at one of its gas storage wells (SS-25) located at the Aliso Canyon Storage facility. Because the incident may lead to legal or regulatory proceedings, on behalf of SoCalGas, we request that B&C take steps to preserve all documents and other evidence that relates to well SS-25 and to SoCalGas' and its consultants' response to the leak. This request includes electronic documents, such as e-mails, Microsoft Word documents, spreadsheets, databases, etc. Please make sure that document retention policies relating to relevant documents are suspended, including any automatic e-mail deletion protocols.

In addition, attorneys from SoCalGas' Law Department have been, and will continue to be, assisting SoCalGas in investigating the circumstances surrounding the leak and supplying legal advice relating to SoCalGas' response efforts. Latham & Watkins LLP ("L&W") has also been retained to assist SoCalGas in these efforts. Attorneys from the Law Department or L&W may from time to time be in contact with B&C as part of their ongoing legal investigation and analysis. Any conversations or communications with, or documents or work requested by or provided to, attorneys for SoCalGas or L&W are covered by the attorney-client privilege and should be kept confidential and shared only with members of the Law Department, L&W or SoCalGas employees working with counsel.

Please feel free to contact me or Marlin Howes in SoCalGas' Law Department if you have questions regarding this letter.

Very truly yours,

Michael G. Romey
of LATHAM & WATKINS

cc: Marlin Howes, Esq.
Glen LaFevers

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SoCalGas

A Sempra Energy utility

12/1/2015

To: HALLIBURTON ENERGY SERVICES, INC.
P O BOX 301341
DALLAS, TX, 75303-1341

AMENDMENT NO. 1 TO HAZARDOUS WORK CONTRACT (AGREEMENT 5660044243)

The following is Amendment No. 1 ("Amendment") to a Hazardous Work Contract (Agreement No. 5660044243), dated October 25, 2015 ("Agreement"), between Southern California Gas Company ("Company") and HALLIBURTON ENERGY SERVICES, INC. This Amendment has an effective date of 12/1/2015 ("Amendment Effective Date").

The parties agree to amend the Agreement as follows:

- Increase funding by [redacted] for a new not-to-exceed funding limitation of [redacted]

THE SATISFACTORY COMPLETION OF THE SERVICES/WORK PERFORMED UNDER THIS AMENDMENT REFLECTS THE FOLLOWING CHANGE IN THE TOTAL AMOUNT DUE UNDER THE AGREEMENT.

PREVIOUS AGREEMENT AMOUNT:	[redacted]
AMENDMENT AMOUNT:	[redacted]
REVISED AGREEMENT AMOUNT:	[redacted]

Other than as specifically modified above, the Agreement shall remain in full force and effect and is hereby ratified, approved and confirmed. This Amendment shall be subject to all of the terms and conditions of the Agreement as amended, as if it were a part thereof, including, without limitation, any provision with respect to choice of law, venue, and/or jurisdiction.

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

APPROVALS

IN WITNESS WHEREOF, the parties have executed this Amendment as of Amendment Effective Date.

Southern California Gas Company		HALLIBURTON ENERGY SERVICES, INC.	
By:	Denita Willoughby	**By:**	Randy Yeager
Name:	Denita Willoughby	**Name:**	RANDY YEAGER
Title:	VP Supply Management & Logistics	**Title:**	AREA VICE PRESIDENT ROCKIES

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SED SUR_REPLY_001803

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Requisition Summary

Requisition Nbr 3140003177 Halliburton - SS25 Work

Created on	Dec 3, 2015	Originator	Carla Brandy	Company	Southern California Gas
Requestor	Todd Van De Putte	Total Amt	[redacted]	Contingency	0
Comments	This change order is requested to increase the amount of funding for this agreement due to the length of the work being performed on SS25 and the inclusion of a relief well. PLEASE NOTE THAT ALL WORK DONE BY HALLIBURTON WHETHER OR NOT BOOTS AND COOTS DIVISION OR NOT WILL BE COVERED UNDER THIS AGREEMENT. Halliburton requires us to use the hazardous work terms and conditions that are part of this agreement to cover the work they do. Directional drilling and control of well work are included under this agreement.				

Initial Workflow Approvers

Sequence	Approver Name	Approval Level Description
00	Todd Van De Putte	Requestor
01	Amy Kitson	Manager
02	Phillip Baker	Director
03	Scott Furgerson	Vice President - Officer

Requisition Approvers

Role	Name	Action	On	Comments
Budgetary Approval	Beth Gates	Rejected	Dec 4, 2015	Hi Carla, Please make Todd Van de Putte the requestor
Requestor Approval	Todd Van De Putte	Approved	Dec 4, 2015	
Budgetary Approval	Amy Kitson	Approved	Dec 4, 2015	
Budgetary Approval	Phillip Baker	Approved	Dec 4, 2015	Approved.
Budgetary Approval	Scott Furgerson	Approved	Dec 7, 2015	

Details

Status	AP	Request Type	Service	PO Type	Change Order
Existing PO .	5660044243	Original Amt	[redacted]	New End Date	May 31, 2016
Start Date	Oct 30, 2015	End Date	Dec 31, 2015	Sole / Single Source	Y
Invoice Contact	Todd Van De Putte	Agent/Delegate	Lanae Hernandez		
Ship To	Southern California Gas Co. SCG 555 West 5th Street Los Angeles CA 90013-1011 US				
	This change order is requested to increase the amount of funding for this agreement due to the				

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Agreement: 5660044243

SoCalGas

A Sempra Energy utility

12/21/2015

To: HALLIBURTON ENERGY SERVICES, INC.
P O BOX 301341
DALLAS, TX, 75303-1341

AMENMDENT NO. 1 TO HAZARDOUS WORK CONTRACT (AGREEMENT 5660044243)

The following is Amendment No. 2 ("Amendment") to a Hazardous Work Contract (Agreement No. 5660044243) dated October 25, 2015, between Southern California Gas Company ("Company") and HALLIBURTON ENERGY SERVICES, INC. This Amendment has an effective date of 12/21/2015 ("Amendment Effective Date").

The parties agree to amend the Agreement as follows:

- Extend the expiration date from December 31, 2015 to May 31, 2016

Other than as specifically modified above, the Agreement shall remain in full force and effect and is hereby ratified, approved and confirmed. This Amendment shall be subject to all of the terms and conditions of the Agreement as amended, as if it were a part thereof, including, without limitation, any provision with respect to choice of law, venue, and/or jurisdiction.

APPROVALS
IN WITNESS WHEREOF, the parties have executed this Amendment as of Amendment Effective Date.

Southern California Gas Company		HALLIBURTON ENERGY SERVICES, INC.	
By:	Richard D. Hobbs	**By:**	Randy Yeager
Name:	Richard D. Hobbs	**Name:**	Randy Yeager
Title:	Director, Supply Mgmt	**Title:**	Area Vice President - Rockies

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SED SUR_REPLY_001805

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SoCalGas

A Sempra Energy utility

January 8, 2016

To: HALLIBURTON ENERGY SERVICES, Inc.

Attention: Ariana Enriquez

P O BOX 301341

DALLAS, TX, 75303-1341

AMENDMENT NO.3 TO HAZARDOUS WORK CONTRACT (AGREEMENT NO: 5660044243)

The following is Amendment No. 3 ("Amendment") to a Hazardous Work Contract (Agreement No. 5660044243), dated October 25, 2015 ("Agreement") between Southern California Gas Company ("Company") and HALLIBURTON ENERGY SERVICES, Inc. ("Contractor"). This Amendment has an effective date of 1/8/2016 ("Amendment Effective Date").

The parties agree to amend the Agreement as follows:

Increase funding by an additional $[redacted] for a new funding limitation of $[redacted] And extend the expiration date of the Agreement to December 31, 2016.

THE SATISFACTORY COMPLETION OF THE SERVICES/WORK PERFORMED UNDER THIS AMENDMENT REFLECTS THE FOLLOWING CHANGE IN THE TOTAL AMOUNT DUE UNDER THE AGREEMENT.

PREVIOUS AGREEMENT AMOUNT:	$[redacted]
AMENDMENT AMOUNT:	$[redacted]
REVISED AGREEMENT AMOUNT:	$[redacted]

Other than as specifically modified above, the Agreement shall remain in full force and effect and is hereby ratified, approved and confirmed. This Amendment shall be subject to all of the

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

terms and conditions of the Agreement as amended, as if it were a part thereof, including, without limitation, any provision with respect to choice of law, venue, and/or jurisdiction.

APPROVALS

IN WITNESS WHEREOF, the parties have executed this Amendment as of the Effective Date.

Southern California Gas Company		HALLIBURTON ENERGY SERVICES, Inc.	
By:		**By:**	
Name:	Dennis Arriola	**Name:**	Randy Yeager
Title:	Chairman, President & CEO of SCG	**Title:**	Area Vice President - Rockies

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SoCalGas

A Sempra Energy utility

October 13, 2016

To: HALLIBURTON ENERGY SERVICES, INC.

Attention: Arianna Enriquez

P O BOX 80118

BAKERSFIELD, CA. 93380

AMENDMENT NO.4 TO HAZARDOUS WORK CONTRACT (AGREEMENT NO: 5660044243)

The following is Amendment No. 4 ("Amendment") to a Hazardous Work Contract (Agreement No. 5660044243), dated October 25,, 2015 ("Agreement") between Southern California Gas Company ("Company") and HALLIBURTON ENERGY SERVICES, Inc. ("Contractor"). This Amendment has an effective date of October 13, 2016 ("Amendment Effective Date").

The parties agree to amend the Agreement as follows:

The expiration date shall be extended from December 31, 2016 to December 31, 2017.

THE SATISFACTORY COMPLETION OF THE SERVICES/WORK PERFORMED UNDER THIS AMENDMENT REFLECTS THE FOLLOWING CHANGE IN THE TOTAL AMOUNT DUE UNDER THE AGREEMENT.

PREVIOUS AGREEMENT AMOUNT:	$[redacted]
AMENDMENT AMOUNT:	$[redacted]
REVISED AGREEMENT AMOUNT:	$[redacted]

Other than as specifically modified above, the Agreement shall remain in full force and effect and is hereby ratified, approved and confirmed. This Amendment shall be subject to all of the terms and conditions of the Agreement as amended, as if it were a part thereof, including, without limitation, any provision with respect to choice of law, venue, and/or jurisdiction.

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SED SUR_REPLY_001808

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

APPROVALS

IN WITNESS WHEREOF, the parties have executed this Agreement as of The Effective Date.

Southern California Gas Company		HALLIBURTON ENERGY SERVICES, INC.	
By:		**By:**	
Name:	Tony Hesam	**Name:**	Robert Harber
Title:	Gas Portfolio Manager	**Title:**	Area Vice President- Rockies

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SoCalGas
A Sempra Energy utility

Southern California Gas Company Standard Services Agreement

PROJECT:	Standard Senson 25	
		MAIL ORIGINAL INVOICE TO
CONTRACTOR:	HALLIBURTON ENERGY SERVICES	Southern California Gas Company
	P O BOX 301341, DALLAS, TX, 75303-1341, United States of America	**ACCOUNTS PAYABLE**
		P .O. BOX 30777 **Los Angeles, CA - 90030**

This Standard Service Agreement ("Agreement") is made effective as of October 30, 2015 between Southern California Gas Company ("Company") and HALLIBURTON ENERGY SERVICES ("Contractor").

The Parties hereby agree as follows:

1. SCOPE

Contractor shall perform, at its own proper cost and expense, in the most substantial and skillful manner, to the satisfaction of Company, the following generally described services ("Services"):

Boots & Coots' have been requested by SoCalGas to submit a proposal for the evolving well control situation on Standard Senson 25. Due to the ever changing conditions at the well, it is hard to give a definitive work scope. Boots & Coots will help provide workable and safe solutions:

- Mobilize one (1) Sr. Well Control Engineer, one (1) Sr. Well Control Specialists, and one (1) Well Control Specialist from Houston to California for Well Control services and forward planning.
- Upon arrival on location they will meet with the SoCalGas command team to discuss ongoing planning requirements and deliverables and determine the level of rates applicable for this specific well event

Note: It is difficult to estimate the number of days required for a successful completion of the project, due to uncertainty with well conditions and necessary equipment. Boots & Coots personnel will only work under safe and assessed conditions with the correct control and mitigation measures in place.

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The main focus is to not allow the situation to worsen or escalate. Work through the situation in a safe, chronological order for the successful killing operation.

The service will be on a daily rate on a portal to portal basis from our base in Houston as per the pricing table included in this proposal.

In the unlikely event of the situation degrading or worsening it may be necessary to mobilize other specialized well control support.

All information regarding the project will remain confidential as always with our services.

2. PROJECT LOCATION

Aliso Canyon
12801 Tampa Avenue
Northridge, CA 91326

3. AUTHORIZED REPRESENTATIVES

Company designates the individual or individuals named below as Company Representatives for all matters relating to the performance of the Services. The actions taken by the Company Representatives shall be deemed acts of the Company. Company may at any time upon written notice to Contractor change the designated Company Representative.

Company Representative: Todd Van De Putte

Contractor designates the individual or individuals named below as Contractor Representative for all matters relating to the performance of Services. The actions taken by Contractor Representative shall be deemed acts of Contractor. Contractor Representative or designated superintendent shall be at the jobsite at all times during the Services. Contractor may at any time upon written notice to Company change the designated Contractor Representative.

Contractor Representative: Leonardo J. Portillo

4. COMPENSATION

Contractor shall be compensated for the Services at the rates set forth in the COMPENSATION SCHEDULE attached hereto in an amount Not-To-Exceed ("NTE") $[redacted] Contractor shall notify Company in writing when the costs incurred under this Agreement equal ninety percent (90%) of $[redacted] Company will not be required to pay Contractor for the Services in excess of the NTE amount unless and until, at Company's sole option, Company elects in writing to increase the NTE amount.

Contractor agrees to accept as full compensation for satisfactory performance of the Services the following labor rates and factors – SCHEDULE D – COMPENSATION.

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

5. COMMENCEMENT AND COMPLETION OF SERVICES

This Agreement shall commence as of October 30, 2015 and shall be in full force and effect through December 31, 2015, unless terminated earlier or extended by Company in accordance with the terms of this Agreement. Contractor agrees to commence and perform the Services in accordance with the requests of Company Representative identified herein. The nature of the Services is such that timely performance is critical to the orderly progress of related work and to the operating schedule of Company.

6. INVOICING INSTRUCTIONS

All invoices submitted must reference the Agreement number (5660044243) and the Invoice Contact (Todd Van De Putte) and have complete support documentation of all charges incurred, including any data required to calculate fees or variable rate changes, plus support documentation for any authorized reimbursable expenses by category.

Contractor may submit invoices via e-mail to:

SCG Accounts Payable: AP_Invoices_SCG@semprautilities.com

7. PAYMENT

Company shall make payment Net 30 Days after receipt and approval of an undisputed invoice to the following address:

P O BOX 301341, DALLAS, TX, 75303-1341, United States of America

Company offers additional discounted payment terms to Contractor pursuant to Contractor's enrollment through Ariba's online platform, which is Company's approved third-party payment platform. If Contractor is enrolled in Ariba's online platform as of the Effective Date, such discounted payment terms shall supersede those set forth in this Section during the period that Contractor maintains its enrollment. If Contractor enrolls in the Ariba online platform and selects certain discounted payment terms after the Effective Date, such discounted payment terms shall supersede those set forth in this Section as of the date of Contractor's enrollment in the Ariba online platform until the date that Contractor is no longer enrolled therein.

8. AUTOMATED CLEARINGHOUSE (ACH) PAYMENT METHOD

Upon enrollment by Contractor, Company shall make payments as automated clearinghouse transactions. Prior to Contractor's enrollment, Company shall make all payments by check to Contractor's address set forth above.

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SED SUR_REPLY_001812

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

9. SAFETY NOTICE

If applicable, Company shall provide Contractor with SCHEDULE C - SEMPRA UTILITIES SAFETY NOTICE attached hereto. Contractor shall initial this notice where required and comply with its terms.

10. COMPLETE AGREEMENT

This Agreement, including all Schedules attached hereto and which are incorporated by reference, constitutes the complete and entire Agreement between the parties and supersedes any previous communications, representations or agreements, whether oral or written, with respect to the subject matter hereof. There are no additions to, or deletions from, or changes in, any of the provisions hereof, and no understandings, representations or agreements concerning any of the same, which are not expressed herein. **THE PARTIES HEREBY AGREE THAT NO TRADE USAGE; PRIOR COURSE OF DEALING OR COURSE OF PERFORMANCE UNDER THIS AGREEMENT SHALL BE A PART OF THIS AGREEMENT OR SHALL BE USED IN THE INTERPRETATION OR CONSTRUCTION OF THIS AGREEMENT.** The following Schedules are attached hereto and incorporated herein by this reference:

SCHEDULE A - GENERAL TERMS AND CONDITIONS

SCHEDULE B - REIMBURSABLE EXPENSES

SCHEDULE C - SAFETY NOTICE FOR CONTRACTORS

IN WITNESS WHEREOF, the parties have executed this Agreement as of October 30, 2015**.**

Southern California Gas Company		HALLIBURTON ENERGY SERVICES	
By:	_____	**By:**	_____
Name:	_____	**Name:**	_____
Title:	_____	**Title:**	_____

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SCHEDULE A

[redacted]

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

[redacted]

Signed in duplicate originals.

_____ (CUSTOMER)	HALLIBURTON ENERGY SERVICES, INC.
By _____	By Mandy Morgan
Title _____	Title VP Product
Date _____	Date 10-27-15

Please remit signed copy to:

US Regional Counsel
Halliburton Energy Services, Inc.
P.O. Box 60087
Houston, TX 77205-0087

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

[redacted]

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

[redacted]

Signed in duplicate originals.

_____ (CUSTOMER)	HALLIBURTON ENERGY SERVICES, INC.
By [signature]	By _____
Title Vice President-Gas Operations	Title _____
Date 10/25/2015	Date _____

Please remit signed copy to:

US Regional Counsel
Halliburton Energy Services, Inc.
P.O. Box 42810
Houston, TX 77242-2810

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SCHEDULE B
REIMBURSABLE EXPENSES

All invoices for reimbursable expenses shall include the Agreement Number, an itemized listing supported by copies of the original bills, invoices, expense accounts and other miscellaneous supporting data. All authorized travel either to San Diego/Los Angeles or from San Diego/Los Angeles to other locations shall be approved in writing in advance by Company Representative. Travel time shall NOT be reimbursed except for travel during normal/regular business hours.

1. **Auto Mileage**

Auto mileage shall be reimbursed at $0.55 per mile, or at the current rate as specified by the United States Internal Revenue Service.

2. **Air Travel**

Airfares shall be reimbursed based on the most direct route at coach class travel rates. Upgrading (coach to a higher class) of airline tickets shall only be reimbursed when approved by Contract Manager, and only when the business schedule requires immediate travel and only higher class accommodations are available. Downgrading (exchange) of airline ticket where Contractor receives financial or personal gain shall NOT permitted. If a trip is postponed, reservations shall be canceled immediately. Contractor shall provide copies of passenger receipts to Company to receive travel expense reimbursement. Travel arrangements shall be made as early as possible (preferably three [3] weeks) to take advantage of advance reservation rates.

3. **Combining Business Travel with Personal Travel**

Contractor may combine personal travel with Company business only if the personal travel does NOT increase the reimbursable cost to Company.

4. **Air Travel Insurance**

Company shall NOT pay for air travel insurance.

5. **Accommodations**

Company shall reimburse hotel room fees at preferred corporate or contract rates. Company may reimburse hotel room fees at the standard rate based on single room occupancy in cases where a corporate or contract rate is NOT available.

6. **Laundry**

Any laundry and dry cleaning charges shall ONLY be paid if Contractor is on travel for Company assignment for a period in excess of six (6) consecutive days.

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SED SUR_REPLY_001818

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

7. **Entertainment**

Company shall NOT pay for the rental of premium channel movies, use of health club facilities or other forms of entertainment.

8. **Meals**

Meals shall be reimbursed on an actual cost basis up to a maximum of $50.00 (Fifty Dollars) per day of travel. Itemized receipts are required and shall be submitted for all meals in the form of a credit card receipt or cash register tape. Company shall NOT pay for alcoholic beverages. In lieu of itemizing meal expenses and submitting receipts, Contractor may claim a standard $31.00 (Thirty-One Dollars) per diem for the duration of the business travel.

9. **Telephone Usage**

Contractor shall submit support documentation regarding all telephone calls charged to Company. The support documentation shall include the name of the party being called and the purpose of the call. Company shall NOT pay for additional business calls unless directly related to this Agreement. Personal telephone calls shall NOT be reimbursed.

10. **Ground Transportation**

Public transportation shall be utilized whenever possible, however if necessary, rental car expenses shall be reimbursed for authorized travel only. Cab fare (on a shared basis whenever possible) is reimbursable. Receipts shall be required to document all ground transportation charges.

11. **Car Rental**

If authorized, Company shall reimburse reasonable car rental charges including gas actually purchased for authorized travel ONLY. Contractor shall be required to rent at an economy car level classification or equivalent, unless the size or purpose of the group using the vehicle dictates a larger size in accordance with the following table:

Travelers	Classification
1-2	Economy/Compact
3	Medium/Intermediate
4-5	Full Size/Standard
6-8	Van

Contractor shall fuel rental cars prior to rental return as rental companies normally add a large surcharge to refueling services.

12. **Parking**

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Contractor shall be reimbursed at cost for reasonable parking expenses incurred in the performance of Services while on Company business.

13. **Tolls and Fees**

Contractor shall be reimbursed at cost for reasonable transportation-related toll and fees incurred in the performance of Services while on Company business.

14. **Baggage Handling**

Contractor shall be reimbursed for baggage handling service fees at standard reasonable rates.

15. **Other Business Expenses**

Any business supplies, equipment rental, reprographics and facsimile expenses shall be reimbursed at cost when traveling on Company business.

16. **Non-Allowable Expenses**

Company shall NOT provide any reimbursement for travel expenses for family members, personal items, charitable contributions, or for any other type of reimbursable.

AC_CPUC_0164713
SED SUR_REPLY_001820

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SCHEDULE C
SAFETY NOTICE FOR CONTRACTORS

Legal - **Safety Notice for Contractors**

Project/Service: _____Date: _____

Job Location (s):_____

Facility Location: _____

Job Duration – from: _____ to: _____ (Date)

Company Contact List:

Contact Identification (include Name of Individual)	**Telephones**	**Contact Identification (include Name of Individual)**	**Telephones**
Legal Representative:	Office: Cell:	Facility Service Main Number:	Office: Cell:
Security:	Office: Cell:	Contractor Administrator:	Office: Cell:
Facility Manager:	Office: Cell:	Environmental Specialist:	Office: Cell:
Facility Maintenance:	Office: Cell:	Safety Representative:	Office: Cell:

	Telephones	**Title and Name**	**Telephones**
Contractor Owner/General Manager:	Office: Cell:	Foreman:	
Manager/Supervisor:	Office: Cell:	Safety/Environmental Representative:	
Other:	Office:		

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

	Cell:		

This Notice is to be issued to each Contractor at a pre–job meeting or other pre–work conference or the safety tailgate meeting before commencing work on the first day of the project. One Notice may be used for multiple projects if the projects present similar hazards or risks as determined by the Legal Representative. Specific safety issues shall be discussed. The Contractor will initial that he/she understands each section and sign the completed Notice. The Notice is to be discussed by the Contractor with each employee who will be working on the job. The Contractor will receive a copy of the Notice, with the original being filed in the appropriate facility office.

1. **Emergency Notification System.** The emergency notification system at this facility or property includes:

_____

and will be used to announce serious or life threatening conditions on site (i.e., fire, earthquake, or emergency evacuation). The competent employee making the announcement will give necessary information regarding type and location of the emergency. Contractors are required to follow instructions given.

In the event of an emergency evacuation, contractors are required to move in an orderly fashion to the Emergency Staging Area located at:

_____

Attached is a facility map that shows emergency exits and staging area. Contractors are required to account for all personnel, report personnel count, and report any missing persons with last known location, injuries, or other issues to the site emergency coordinator. Contractors are not to leave the emergency staging area until instructed to do so.

_____ Applicable_____ Not Applicable

Initials: _____

2. **Facility Phones.** Outside phone lines can be accessed by dialing "9" or _____ and the number you desire including area code if outside of calling area. *If it becomes necessary to secure site phone lines, the Contractor will notify the Company's facility manager or representative*. Note: Company phone usage by the Contractor is limited to urgent or emergency needs. Cell phone usage is prohibited in many areas of Storage Fields and Compressor Stations.

_____ Applicable_____ Not Applicable

Initials: _____

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

3. **Personal Protective Equipment.** The Contractor is responsible for providing its employees with all the required personal protective equipment (e.g., hard hats, safety glasses, gloves, hearing protection, personal fall protection, etc.).

Initials: _____

4. **No Smoking.** Smoking is not permitted in any Company building or vehicle. Designated smoking areas are:

_____

Initials: _____

5. **Non-English Speaking Personnel.** Non-English speaking personnel are the Contractor's responsibility and must have an English speaking / English-reading interpreter with them at all times.

Initials: _____

6. **Contractors' Injury and Illness Prevention Program.** Contractors when required shall have a written Injury and Illness Prevention Program per Title 8, California Code of Regulations, General Industry Safety Orders, Section 3203. The Company reserves the right to request proof (at any time) of the Injury and Illness Prevention Program.

Initials: _____

NOTE: Receipt of the Contractor's Injury and Illness Prevention Plan and/or the safety and health plan only signifies that the plans generally conform to the requirements of the contract and NOT Legal approval of the plans. It does not relieve the Contractor of the responsibility for providing employees with a safe and healthful work environment.

7. **Registration with Veriforce LLC**. Prior to commencement of DOT–covered work, the Contractor must register with Veriforce LLC (Legal DOT Drug and Alcohol program and OpQual compliance review agent) and complete an OpQual and Drug & Alcohol Program Compliance Review.

_____ Applicable_____ Not Applicable

Initials: _____

8. **Anti-Drug and Alcohol Misuses Prevention Program.** The Contractor shall have a written Anti-Drug and Alcohol Misuses Prevention Program. The Contractor shall have a written Anti-Drug and Alcohol Misuses Prevention Program that meets the requirements of all applicable regulations, including but not limited to 49 CFR, Part 40, Part 199, and Part 382, as it may apply. The Contractor shall ensure it, or its agent(s), i.e., Third Party Consortiums, comply with and conduct random drug and/or alcohol testing in accordance with 49 CFR Part 40, Part

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SED SUR_REPLY_001823

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199, and Part 382, as it may apply. In addition, proper review, reporting, and enforcement of drugs and/or alcohol testing of incidents meeting the post-accident criteria of 49 CFR Part 40, Part 199, and Part 382 has been discussed. The Contractor shall notify the Company Drug and Alcohol Testing Program Administrator of any and all incidents requiring Post Accident Testing and reports compliance.

_____ Applicable_____ Not Applicable

Initials: _____

9. **Operator Qualification Program.** The Contractor shall have a written and accepted Operator Qualification Plan on file that meets the requirements of all applicable regulations, including but not limited to Title 49, Code of Federal Regulation Part 192.801 through 192.809. Contractors must identify the scope of work and covered services/tasks they will provide to the Company(s) prior to commencement of DOT–covered tasks. Contractors must contact the Operator Qualification Department (OpsQual–Admin@semprautilities.com) and register with Veriforce, LLC, the Company's Contractor Compliance Review Agent, to initiate a DOT compliance review. Contact the Operator Qualification Department for additional information.

_____ Applicable_____ Not Applicable

Initials: _____

10. **Hazardous Materials.** Safety Data Sheets are available for hazardous substances used at the Company's facilities. Contact the Legal Representative for assistance for copies of SDS if necessary.

• Proposition 65 chemicals may be present when working on Legal facilities and signs may be posted stating "WARNING: This area contains chemicals known to the State of California to cause cancer, and birth defects or other reproductive harm."

• Naturally Occurring Radioactive Materials (NORM) may be present in the gas and associated sludge and liquids in the pipelines.

• The Contractor must have prior approval from the Company's Environmental Services and Safety and Health departments before bringing on site any hazardous substances that might create an exposure to Legal Company employees or an impact to the environment.

• Prior to the start of a job or project, the Contractor will disclose any and all hazardous materials use with the Legal Representative.

NOTE 1: Within 5 working days prior to use, the Contractor must provide notice in advance of planned uses of any odor-producing substances (e.g., petroleum or chemical-based building materials, solvents or cleaners) and dust or smoke-producing activities that may cause Legal employee or public concerns or discomfort. An action plan must be coordinated with Legal representatives, including Safety and Health, and affected site

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management to prevent employee or public exposure and avoid unplanned interruption of work.

NOTE 2: Within 5 working days prior to use, where there is the potential for Legal employees to be exposed to hazardous materials used by contractor, Legal representative shall contact Safety and Health for a product review to ensure the safety of our Company employees and the public.

NOTE 3: In cases where Legal purchases hazardous materials for contractors to use, these products must go through the SEPA – Safety & Environmental Product Approval Process.

NOTE 4: In cases where the Contractor will be storing hazardous materials at Company facilities or project locations, it is the Legal representative's responsibility to inspect that area for proper storage of compatible materials.

_____ Applicable_____ Not Applicable

Initials: _____

11. **Asbestos–Containing Construction Materials.** No asbestos–containing construction materials (ACCM) shall be used for construction or left at Legal sites.

_____ Applicable_____ Not Applicable

Initials: _____

12. **Asbestos Containing Materials (ACM)**. If the facility where the Contractor will work has ACM, the Contractor understands the asbestos notification letter and applicable list of ACM and/or asbestos sample results provided by the Legal Representative, and understands not to disturb ACM or any material without asbestos content determined and documented unless specifically contracted and authorized by Legal for that work.

_____ Applicable_____ Not Applicable

Initials: _____

13. **Surface Coatings containing Lead or Other Metals.** Any potential lead (Pb) exposure hazards and lead and other metals in surface coating exposure hazards must be identified. All painted surfaces shall be assumed to contain lead and other metals unless shown otherwise by sampling and analysis. If lead or other metals are encountered, contractor and the Company will determine who will be responsible for removing them in compliance with applicable regulations. The Contractor may, at the discretion of the Company, disturb/remove less than 100 square feet of surface coatings containing lead, arsenic, cadmium, hexavalent chromium and/or mercury, providing the Contractor (a) submits their written Cal/OSHA compliant lead safety program to the Legal Representative prior to work on lead–containing materials, (b) generates no visible

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dust emissions, and (c) manages waste in accordance with regulations and requirements (if any) of Legal Environmental Services.

Below is a listing of potential lead containing materials or lead and other metals in surface-coatings:

_____

The contractor shall be provided with this notice (including lead concentrations when known):

Lead, as well as other metals including but not limited to arsenic, cadmium hexavalent chromium and mercury, are commonly present in paint at varying concentrations in painted surfaces. Therefore, as an employer, you are expected to comply with all applicable regulations for protection of the workers and the environment, including but not limited to Cal/OSHA, prior to and during disturbance or removal of lead or other metal containing paint. Lead, arsenic, cadmium and chromium VI are substances known to the State of California to cause cancer /or birth defects and other reproductive harm.

_____ Applicable_____ Not Applicable

Initials: _____

14. **Proposition 65 Chemicals**. The Contractor shall not create at the work site an environmental or occupational exposure to Proposition 65 listed chemicals unless the Contractor provides the required Proposition 65 warning to Legal and other persons who may be exposed. If the work site creates occupational exposure to Proposition 65 chemicals, contact the Field Environmental Representative or Safety and Health Department Hazard Communication Administrator for instructions on attaching information on Proposition 65 chemicals to this notice.

_____ Applicable_____ Not Applicable

Initials: _____

15. **Handling and Disposal of Contractor's Hazardous Materials.** Proper handling and disposal of hazardous materials that the Contractor brings on–site, including primary and secondary chemical labeling, location of the Contractor's SDS, is required of the Contractor.

_____ Applicable_____ Not Applicable

Initials: _____

16. **Confined Space Program.** The Contractor understands the requirement of working in permit required confined spaces and will comply with all applicable laws and regulations involving confined spaces. The Contractor will verify to the Legal Representative they have a

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

permit required confined space program and have received information on Legal permit–required confined spaces that may be entered (including hazards, precautions) and will debrief after the entry with the Legal Representative regarding hazards of the entry.

_____ Applicable_____ Not Applicable

Initials: _____

17. **Hot Work Permit.** The Contractor understands the requirements to obtain an Legal hot work permit or to issue a hot work permit after Legal Representative approval and to comply with any permit requirements use of open flame, torch or welding equipment. The Contractor will comply with all the applicable laws and regulations required with these permits.

_____ Applicable_____ Not Applicable

Initials: _____

18. **Crane Lifting Plan.** The Contractor has lifting plan for cranes, including side booms if applicable, and will comply with all applicable laws and regulations involving cranes.

_____ Applicable_____ Not Applicable

Initials: _____

19. **Naturally Occurring Radioactive Materials – NORM.** The Contractor understands the requirement/guidelines of working with NORMs and will comply with all applicable laws and regulations dealing with safety and radiation.

_____ Applicable_____ Not Applicable

Initials: _____

20. **Safety Rules/Stop The Job.** The Contractor acknowledges that its employees must follow applicable safety rules while on Company facilities and properties. If an unsafe work condition or activity is identified, anyone working onsite has the authority to stop the job. All work will immediately cease once the Stop The Job is declared until the involved Contractor(s) have done a thorough investigation, remediated the unsafe situation, determined it is safe and communicated this to the SCG Representative and all affected employees. It is also the expectation that the Contractor's employees will abide by the Contractor's safety rules at all times. Known potential hazards at Company facilities and properties that have the potential to impact the Contractor's employees have been communicated to the Contractor. Such items may include but not limited to, equipment operations, energized electrical systems, fall hazards, etc.

_____ Applicable_____ Not Applicable

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Initials: _____

21. **Reporting of Incidents.** Contractor will immediately report to the Legal Representative any project–related incidents resulting in fires, hazardous situations, hazardous substance releases, OSHA recordable occupational injuries and illness, serious near misses, any injury or property damage involving the public and Stop The Job actions. A preliminary written report will be submitted within 10 working days followed with a final report within a reasonable time frame thereafter, to the Legal Representative, who will then forward it to the designated Field Safety Advisor.

_____ Applicable_____ Not Applicable

Initials: _____

22. **Agency Inspections.** Contractor will immediately notify Legal Representative of any governmental agency (Cal/OSHA, Health Dept. etc.) incident, complaint, inspection and any "Notice of Violation" or "Notice to Comply" issued by a government agency at the Contractor's job site. Any environmental related issue must be reported to the Environmental Representative. Contractor shall not provide any information to the government representative, unless otherwise instructed to by the Legal representative.

_____ Applicable_____ Not Applicable

Initials: _____

23. **Special Safety Concerns and Hazard Assessment (Related to the specific job)**.

Specific Job Location:

_____

Special Safety Concern:

_____

Specific Job Location:

_____

Special Safety Concern:

_____

Special Job Location:

_____

Special Safety Concern:

_____

Special Job Location:

_____

Special Safety Concern:

_____

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Note: *Contractors are responsible for obtaining all needed permits prior to working, such as applicable shoring, and trenching permits. For confined space entry, any potential hazards, testing and evaluation procedure, elimination or control of hazards, entry requirements, entry permits and plans for emergencies must be discussed prior to work beginning. Who will be responsible for testing and evaluation procedures must be determined prior to any job beginning (i.e., Contractor or Company). The Company reserves the right to review or request proof of the Contractor's confined space training and compliance program.*

Initials: _____

Emergency Telephone Numbers and Address:
The nearest hospital address and number is:

_____

_____

The Company facility address is:

_____

_____

For medical and fire emergencies, please contact 911. The Contractor understands the proper reporting of fires, hazardous situations, hazardous substance releases, incidents, OSHA recordable occupational injuries and illnesses, and serious near misses. The Contractor also understands the proper review, reporting and enforcement of drug and/or alcohol testing of incidents meeting the post–accident criteria of CFR Title 49, Part 40, Part 199 and Part 382.

By signing this Safety Notice for Contractors, the Contractor agrees to follow the applicable requirements as outlined in this document. Failure to do so may result in work stoppage and/or termination of contract.

Copies of the Safety Notice for Contractors must be maintained pursuant to the company's file retention policy.

Contractor Representative Name:	Legal Representative's Name:
Contractor Representative Phone Number:	Legal Representative's Phone Number:
Signature of Contractor:	Signature of Legal Representative:
Date Form Completed:	Date Form Signed:

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SCHEDULE D
COMPENSATION

2. Pricing

Item	Reference No.	Description of Services/Personnel	Level	Unit	Unit Rate (USD)
		Sr. Well Control Specialist			[redacted]
1	700012		Level One (1)	Per man, per day	
2	700013		Level Two (2)	Per man, per day	
3	700014		Level Three (3)	Per man, per day	
4	700015		Level Four (4)	Per man, per day	
		Well Control Specialist			
5	700016		Level One (1)	Per man, per day	
6	700017		Level Two (2)	Per man, per day	
7	700018		Level Three (3)	Per man, per day	
8	700019		Level Four (4)	Per man, per day	
		Sr. Well Control Engineer			
9	700021		Level One (1)	Per man, per day	
10	700022		Level Two (2)	Per man, per day	
11	700023		Level Three (3)	Per man, per day	
12	700024		Level Four (4)	Per man, per day	
		HSE Specialist			
13	700029		Level One (1)	Per man, per day	
14	700030		Level Two (2)	Per man, per day	
15	700032		Level Three (3)	Per man, per day	
16	700033		Level Four (4)	Per man, per day	
17	700265	**Offshore Personnel Surcharge,**		Per man, per day	
18	[redacted] All travel and related ground transportation per person.			Per man	[redacted]

CHAPTER 5
EXHIBITS

Response to Data Request

Response to SED Data Request-82

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 82 related to casing failure analysis and casing leaks from Reply Testimony of Mr. Travis Sera on behalf of SoCalGas.

Date:
Jun. 12, 2020

Version:
1

Project Number:
N/A

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Blade Energy Partners Limited and its affiliates (Blade) provide our services subject to our General Terms and Conditions (GTC) in effect at time of service, unless a GTC provision is expressly superseded in a separate agreement made with Blade. Blade's work product is based on information sources which we believe to be reliable, including information that was publicly available and that was provided by our client; but Blade does not guarantee the accuracy or completeness of the information provided. All statements are the opinions of Blade based on generally-accepted and reasonable practices in the industry. Our clients remain fully responsible for all clients' decisions, actions and omissions, whether based upon Blade's work product or not; and Blade's liability solely extends to the cost of its work product.

Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	Jun. 12, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

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2 **Questions and Responses** **5**

2.1 Question 1 5

2.2 Question 2 6

3 **References** **9**

1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on April 17, 2020. Data Request No: SED 82 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED Data Request 82 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The questions are related to the document titled: *Chapter V, Prepared Reply Testimony of Travis Sera on behalf of Southern California Gas Company (U 904 G)* (file name: "5_Ch. V - Sera (A Final).pdf").

2 Questions and Responses

2.1 Question 1

1. On page 5, in the "Conclusion" section of the testimony, it states, "For the foregoing reasons, a failure analysis of any of the historical leaks described in the Blade Report would very likely not have informed or predicted the SS-25 incident." With this passage in mind, please answer the following:

2.1.1 Blade Responses

a. In Blade's expert opinion, does Blade agree with this conclusion?

No.

b. If not, why not?

One cannot conclude that the analysis of the historical leaks would not inform or predict the SS-25 incident because the historical leaks were not analyzed by SoCalGas according to data provided to Blade.

In the Executive Summary of Blade's Main report, page 2, Blade stated, "Based on the data available to Blade, no details regarding the nature or cause of these leaks and failures were available because no failure analyses were done. Forty percent of the gas storage wells reviewed by Blade had casing failures with an average of two casing failures per well. The FF-34A well file mentioned a study of the possible external casing corrosion problems in the southeastern portion of the field, but Blade was not able to locate any documentation related to this study [reference omitted]".

Prior to October 23, 2015, none of the historical leaks caused a release of gas into the atmosphere similar to SS-25. However, to conclude that the failure in the SS-25 production casing was somehow different from every other leak in the field requires an investigation and evaluation of historical leaks. In other words, the consequence of the SS-25 7 in. casing failure was different and much more severe, but the underlying cause may have been similar, or not, to previous casing failures. The data provided to Blade indicated casing failures were investigated to determine their location in the well; in almost all cases, the question of *where did the casing failure occur* was answered. But Blade did not find the answers to questions such as: *why did the casing failure occur*, *when will it occur again*, and *how can we prevent these failures*. Because of this information gap, any comparison of the SS-25 failure to other Aliso Canyon casing failures was partial and lacking.

The occurrence of casing corrosion was recognized by SoCalGas. As discussed in Blade Main Report on page 239 "The limitations of this reactive approach to well integrity management was identified by SoCalGas in 2014 as evidenced by the SIMP proposal in the 2016 General Rate Case Submission. OD corrosion on production casing was identified as a threat". The following statements are from that testimony [1, pp. PEB 18 - PEB 19] (verbatim):

> The primary threats to the SoCalGas well facilities that SIMP will address are internal and external corrosion, and erosion. [footnote omitted] Once an issue is identified, the initiation of critical repair work identified will immediately minimize safety risks.

> Presently, most major O&M and capital funded activities conducted on storage wells are typically reactive-type work, in response to corrosion or other problems identified through routine pressure surveillance and temperature surveys. . . . In most cases, situations like this can be indicative of production casing leaks from either internal or external corrosion where high pressure gas can migrate to the surface in a matter of hours. External corrosion has also been observed in other wells at the field.

Furthermore, in their rate case testimony (page 17), SoCal Gas stated the following (verbatim):

> A proactive, methodical, and structured approach, using state-of-the-art inspection technologies and risk management disciplines to address well integrity issues before they result in unsafe conditions, or become major situational or media incidents, is a prudent operating practice.

c. Provide any documentation necessary in support your answer.

See response to Question 1 b.

2.2 Question 2

2. Please refer to the following passage on pages 1 and 2 of the document identified at the outset of this data request:

"II. LEAKS DISTINGUISHED FROM RUPTURES.

Wall loss anomalies in pressure-containing tubular structures like pipes can fail by either leak or rupture once they grow to a critical size – i.e., a size that reduces the failure pressure equal to or below (≤) the operating pressure. Whether the structure fails by leak or rupture depends upon 1) the material properties of the structure, 2) the 1 [sic] size, shape, and orientation of the flaw, and 3) the level of stress applied to the flaw. As a general matter with regard to corrosion related wall loss, leaks are typically associated with deeper flaws that do not propagate in length after initial perforation of the full wall thickness. In contrast to leaks, ruptures are typically longer in axial length to a degree sufficient to promote a localized elevated stress state (often resulting in bulging) and eventual through-wall failure. Ruptures are distinguished from leaks in that the flaw propagates or extends beyond the initial dimension of the perforation, and typically in the axial direction for hoop stress-related failures."

For this question, please also refer to the following passage on page 2 of the document entitled "Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon SS-25" by Blade Energy Partners, dated May 16, 2019 (hereafter referred to as "Root Cause Analysis").

"The Aliso Canyon storage wells had numerous casing leaks. Blade reviewed 124 gas storage wells and identified 63 casing leaks, 29 tight spots, 4 parted casings, and 3 other types of failures. Based on the data available to Blade, no details regarding the nature of [sic] cause of these leaks and failures were available because no failure analyses were done."

With both of these passages in mind, please answer the following:

2.2.1 Blade Responses

a. Is the definition in the first passage of the term "leak" the same way as the term "leak" as defined in the Root Cause Analysis, including the passage from the Root Cause Analysis shown above?

No.

The term "leak" in the first passage of Question 2 (from Mr. Sera's testimony) indicates a failure mode. The Blade reports generally used the word "leak" to indicate a flow path or hole that allowed fluid flow from inside the casing to the outside. When the SS-25 casing failure was discussed, the word "rupture" was used to describe the type or mode of failure. Obviously, a rupture in the casing is also a leak that allows flow, but the converse is not always true. A leak is not necessarily a rupture. The two definitions of the word "leak" as discussed are consistent with commonly used definitions in the oil and gas industry for casing failure and failure analysis depending on the context.

b. If the answer to question 2a is no, how is the term "leak" defined in the Blade Root Cause Analysis?

The term "leak" as used in the Blade Root Cause Analysis is consistent with the definitions commonly used in the oil and gas industry for failure and failure analysis, and is used appropriately throughout the Blade Main Report and Supplementary Reports. The term "rupture" was used in the discussion of the failure mode in the RCA. For example, the first paragraph of the Executive Summary on page 1 of the Blade Main Report, states: "The Standard Sesnon 25 (SS-25) well was shut in at 3:30 PM on October 23, 2015; a leak was discovered at 3:15 PM. The 7 in. production casing had axially ruptured and circumferentially parted. This resulted in a blowout and gas release into the atmosphere, which lasted for 111 days, until the well was eventually killed via a relief well on February 11, 2016." Here the term "a leak" is the general term indicating a flow path from inside the casing to the atmosphere while the terms "axially ruptured and circumferentially parted" defined specific failure modes.

The discussion of failed casing in the Blade Main Report and Supplementary Reports used the general term "leak" to reflect the fact that casing leaks were identified but no details regarding the nature or cause of these leaks and failures were available because no failure analyses were done based on the data available to Blade. For example, the fourth paragraph of the Executive Summary on page 2 of the Blade Main Report, states: "The Aliso Canyon storage wells had numerous casing leaks. Blade reviewed 124 gas storage wells and identified 63 casing leaks, 29 tight spots, 4 parted casings, and 3 other types of failures. Based on the data available to Blade, no details regarding the nature or cause of these leaks and failures were available because no failure analyses were done."

c. If the answer to question 2a is no, what are the differences in the two definitions of leak from the document above and the Blade Root Cause Analysis?

The differences are articulated in the responses to Question 2 a. and 2 b.

d. Provide any additional context or documentation necessary to support your answers.

Mr. Sera has described two possible failure modes; a leak failure mode and a rupture failure mode. Aliso Canyon casing leaks could have been either. The failure mode can only be distinguished through failure analysis of casing leaks. During in-service casing failures, the amount gas released does not provide foregone conclusions on the failure mode. In the case of surface or near surface pipelines, relating quantity of release to failure mode is valid. But the same is *not* true for wells. In pipelines, the gas has to travel only a short distance to reach the atmosphere. Usually the gas rates speak to the size of the opening. In wells, the amount of gas released is a function of the size of the opening, pressure within the casing, pressure and permeability of the surrounding material, post-leak operations, and many other factors. In many cases, the leak is hundreds or thousands of feet below ground level. The amount of gas released in wells does not

indicate whether the casing has corroded, parted, split, collapsed, nor burst. Only through investigation and analyses, can the failure mode be determined.

3 References

[1] SoCalGas, "2016 General Rate Case, Direct Testimony Underground Storage, November 2014, AC_BLD_0008075-AC_BLD_0008088 (SoCalGas_StorageIntegrityManagementPlan_SIMP.pdf)".

Response to Data Request

Response to SED Data Request-82

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 82 related to casing failure analysis and casing leaks from Reply Testimony of Mr. Travis Sera on behalf of SoCalGas.

Date:
Jun. 12, 2020

Version:
1

Project Number:
N/A

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Furthermore, in their rate case testimony (page 17), SoCal Gas stated the following (verbatim):

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With both of these passages in mind, please answer the following:

2.2.1 Blade Responses

a. Is the definition in the first passage of the term "leak" the same way as the term "leak" as defined in the Root Cause Analysis, including the passage from the Root Cause Analysis shown above?

No.

The term "leak" in the first passage of Question 2 (from Mr. Sera's testimony) indicates a failure mode. The Blade reports generally used the word "leak" to indicate a flow path or hole that allowed fluid flow from inside the casing to the outside. When the SS-25 casing failure was discussed, the word "rupture" was used to describe the type or mode of failure. Obviously, a rupture in the casing is also a leak that allows flow, but the converse is not always true. A leak is not necessarily a rupture. The two definitions of the word "leak" as discussed are consistent with commonly used definitions in the oil and gas industry for casing failure and failure analysis depending on the context.

b. If the answer to question 2a is no, how is the term "leak" defined in the Blade Root Cause Analysis?

The term "leak" as used in the Blade Root Cause Analysis is consistent with the definitions commonly used in the oil and gas industry for failure and failure analysis, and is used appropriately throughout the Blade Main Report and Supplementary Reports. The term "rupture" was used in the discussion of the failure mode in the RCA. For example, the first paragraph of the Executive Summary on page 1 of the Blade Main Report, states: "The Standard Sesnon 25 (SS-25) well was shut in at 3:30 PM on October 23, 2015; a leak was discovered at 3:15 PM. The 7 in. production casing had axially ruptured and circumferentially parted. This resulted in a blowout and gas release into the atmosphere, which lasted for 111 days, until the well was eventually killed via a relief well on February 11, 2016." Here the term "a leak" is the general term indicating a flow path from inside the casing to the atmosphere while the terms "axially ruptured and circumferentially parted" defined specific failure modes.

The discussion of failed casing in the Blade Main Report and Supplementary Reports used the general term "leak" to reflect the fact that casing leaks were identified but no details regarding the nature or cause of these leaks and failures were available because no failure analyses were done based on the data available to Blade. For example, the fourth paragraph of the Executive Summary on page 2 of the Blade Main Report, states: "The Aliso Canyon storage wells had numerous casing leaks. Blade reviewed 124 gas storage wells and identified 63 casing leaks, 29 tight spots, 4 parted casings, and 3 other types of failures. Based on the data available to Blade, no details regarding the nature or cause of these leaks and failures were available because no failure analyses were done."

c. If the answer to question 2a is no, what are the differences in the two definitions of leak from the document above and the Blade Root Cause Analysis?

The differences are articulated in the responses to Question 2 a. and 2 b.

d. Provide any additional context or documentation necessary to support your answers.

Mr. Sera has described two possible failure modes; a leak failure mode and a rupture failure mode. Aliso Canyon casing leaks could have been either. The failure mode can only be distinguished through failure analysis of casing leaks. During in-service casing failures, the amount gas released does not provide foregone conclusions on the failure mode. In the case of surface or near surface pipelines, relating quantity of release to failure mode is valid. But the same is *not* true for wells. In pipelines, the gas has to travel only a short distance to reach the atmosphere. Usually the gas rates speak to the size of the opening. In wells, the amount of gas released is a function of the size of the opening, pressure within the casing, pressure and permeability of the surrounding material, post-leak operations, and many other factors. In many cases, the leak is hundreds or thousands of feet below ground level. The amount of gas released in wells does not

indicate whether the casing has corroded, parted, split, collapsed, nor burst. Only through investigation and analyses, can the failure mode be determined.

3 References

[1] SoCalGas, "2016 General Rate Case, Direct Testimony Underground Storage, November 2014, AC_BLD_0008075-AC_BLD_0008088 (SoCalGas_StorageIntegrityManagementPlan_SIMP.pdf)".

INTEROFFICE CORRESPONDENCE

SOUTHERN CALIFORNIA gas COMPANY

TO Mr. N. D. Stevenson FROM J. D. Mansdorfer DATE April 2, 1985

SUBJECT 1985 Aliso Canyon Well Repair Activity

The rig schedule dated March 28, 1985, indicates that repair work on Aliso Canyon Frew 3, IW-62, IW-73 and IW-81 is being deferred beyond 1985. Deliverability of these wells at low inventory is as follows:

Well	Deliverability at 20 Bcf, MMcf/D
Frew 3	24
IW-62	37
IW-73	30
IW-81	42
	133

With these four wells and the wells that are "permanently" out of service, such as MA-3, 4 and 5; PF-1, 2 and 3 and IW-58, we are down to 90% capacity for the 1985-86 withdrawal season before running a single well survey in 1985.

The number of well leakage problems in a storage field during a given year seems to be somewhat proportional to the magnitude of the pressure reversal that year. Reservoir pressure at Aliso Canyon is the lowest it has been in 12 years. If inventory goes up to 50 Bcf or higher, I would expect to find a number of leaks this year. If we lose 3 good wells or 5 mediocre wells, we will be down to 80% capacity.

All four of the wells mentioned above have casing leaks and were recommended for inner strings or large tubing at a capital cost of approximately $350,000 each. The casing leak in each of the three IW wells are relatively small, the leak in Frew 3 is large. I propose that we perform a temporary fix on the three IW wells by installing a casing patch for a maintenance cost of $120,000 each. These maintenance dollars can be offset, if necessary, by deferring the shoe leak repair on SS-6. SS-6 is a poor well that contributes very little to deliverability at low inventory. We can noise log the well when inventory gets above 35 Bcf this year. If the severity of the shoe leak merits it, we can kill the well and leave it killed through withdrawal season without much effect on deliverability.

Because the three IW wells that are in need of repair are all located on drillsites, the repair work should be completed before withdrawal season. To accomplish this, I recommend that this work be scheduled for the time slot allotted to WEZU 20. WEZU 20 can be rescheduled for the time slot allotted to SS-6 because it is not located on a drillsite.

Another consideration is that to maintain the same peak day protection (deliverability) without IW-62, IW-73 and IW-81 we will have to inject an additional 2.8 Bcf of gas this year. This is from the published

Aliso Canyon deliverability curve. At 12% interest, the carrying cost of 2.8 Bcf of gas for a year is $1.34 million. Also, the cost to compress 2.8 Bcf of gas is $360,000.

Therefore, the additional cost to maintain a given level of deliverability this year without repairing these three wells will be $1.7 million. The cost to put the wells in service would be under $400,000.

JDM/als
Attachment
cc: Mr. R. M. Morrow
Drilling Superintendent ✓

SOUTHERN CALIFORNIA GAS COMPANY

COST SUMMARY SHEET

Field ALiso Canyon Well Frew #3 G.W.O.#

Job Category E,H,Y M.W.O.#

Date 12-13-85 Compiled By G. C. Abrahamson Checked By

Total Rig Hours 256 Total G.W.O. Cost $360,000

Number of Days 19 calendar days Total M.W.O. Cost

Prog. Step	Work Description	Work Cat.	Cum. Hrs.	GWO=1 MWO=0	Itemized Cost: Service & Tool	Purchased Materials	Purchased Supplies	Trans.	GWO Total	MWO Total
0	Kill well	14	-	1	4,000		4,000		8,000	
1	Move in and rig up	11 12	16	1	6,460			3,000	9,460	
2,3 3a	Install BOPE & pressure tst	13	32	1	6,360		200		6,560	
4	Pull tubing	15	48	1	6,960				6,960	
5	C.O. to 7650' Run impression blk	15	64	1	5,960		1,000		6,960	
6	Run casing inspection log	29	80	1	8,960				8,960	
7 8	Cement leak at 1160'	16	112	1	19,920				19,920	
9	Install inner string spool	16	128	1	4,960	8,000			12,960	
10	Recover b.plug lay dwn tubing	16	144	1	4,960			2,000	6,960	
11	Run 5-1/2" inner string	30	176	1	17,420	120,000		3,000	140,420	
12 13	Set pckr and pressure tst	21	192	1	8,460	36,000		2,000	46,460	
14,15 16,17	Run tbg & complete	21	224	1	15,420	20,000			35,420	
	Totals		224 hours						309,040	
	Pre and post rig								12,500	
	Total		224 hours						321,540	
	Time contingency		32 hours						9,920	
	Total		256 hours						331,460	
	Cost contingency								28,540	
	Totals		256 hours 19 calendar days (184,000)						360,000	

SED SUR REPLY 001852

AC_CPUC_0023079

The Gas Company℠

Interoffice Memo

To: R. C. Wiegman

From: P. D. Yu

Date: February 20, 1992

Subject:

Well FF-34A Cathodic Protection

Storage Operations recommends the installation of cathodic protection in well FF-34A at an estimated cost of $25,000 to $30,000. Storage Operations has provided the necessary funds for this project in its 1992 budget and the Division is requested to oversee the installation as soon as it is operationally feasible.

Cathodic protection is recommended for this well in light of our discoveries of external casing corrosion during the workover in July of 1991. Metal loss averaging approximately 15% was indicated over the interval of 1000' to 4000' and the hole in the casing was discovered at 2104'. The cost of installing and maintaining the cathodic protection is minimal when compared to the potential cost ($400,000) of a workover should problems develop in the future.

Please inform me when a completion data for this project is anticipated. If you have any questions, do not hesitate to ask.

RDO:sw:FF34A

cc: R. D. Phillips

WELL HISTORY FILE

SED SUR_REPLY_001853

AC_CPUC_0022178

CHAPTER 6
EXHIBITS

Confidential and Protected Materials Pursuant to
PUC Section 583, GO 66-D, and D.17-09-023

From: Schroeder, Tom
Sent: Thursday, August 7, 2014 11:53 AM
To: Egbert, Thomas; Van de Putte, Todd
Cc: Neville, Dan
Subject: SIMP Well Documentation

Guys, P42B, SS44A and SS9 will be included in our pilot SIMP program for 2014. We will need to complete the establishment of the protocol documentation, an operation history and cost history for each well. Todd, we need to format why we moved on to each well such as SSSV issues, Wellhead Leak or questionable Liner Performance as well as what was begun on O&M and how the well moved to a capital workover category. Tom, we need to make sure that Schlumberger does a complete analysis of the USIT logs run in each case and put together our records retention and planned follow up on our findings. We can discuss more later. Tom

Tom W. Schroeder
Storage Engineering Manager
Southern California Gas Company
(818) 700-3811 (Office)
[redacted]*(Cell)*

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SED SUR_REPLY_001855

AC_CPUC_SED_DR_25_0001321

The table below is supplied by Southern California Gas Company on the first and third Friday of each month as required by Order No. 1109. This table contains additional information than is displayed on the Division's Tests Results of Aliso Canyon Wells Website.
Terminology used in the status column is different than what is used on the Division's web page. Users should refer to the Division's map and table to gauge Southern California Gas Company's progress in complying with Order No. 1109.

Well Name	API Number	Noise/Temp			DOGGR Approval	Ultrasonic (USIT)			Magnetic Flux (CsgInsp)			Cement Bond Log (CBL)			Multi-Arm Caliper (MAC)			Block Test	DOGGR Approval	Annulus / Tubing Test	DOGGR Approval	Other	Current Status
SIMP Wells Assessed	Number	Ran Date	Submitted Date	Submitted By	Approval Date	Ran Date	Submitted Date	Submitted By	Ran Date	Submitted Date	Submitted By	Ran Date	Submitted Date	Submitted By	Ran Date	Submitted Date	Submitted By	Test Date	Approval Date	Test Date	Approval Date	Comments	Status
Fernando Fee 32	03700686	03/08/16	03/11/16	Azra Kargar	03/18/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32A	03721872	03/08/16	03/11/16	Azra Kargar	03/18/16	03/30/16	05/06/16	AJ Alshammasi	04/01/16	07/15/16	AJ Alshammasi	03/30/16	04/07/16	Jovy Kroh	09/01/16	09/08/16	AJ Alshammasi	04/04/16	09/16/16	09/07/16	09/16/16		Passed All Tests
Fernando Fee 32B	03721358	03/09/16	03/11/16	Azra Kargar	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32C	03721359	03/09/16	03/11/16	Azra Kargar	Failed N/T	10/11/16	10/18/16	AJ Alshammasi	05/26/16	06/09/16	AJ Alshammasi	10/11/16	10/18/16	AJ Alshammasi	10/08/16	10/18/16	AJ Alshammasi	10/07/16		10/20/16		Rig	Pending Test Results
Fernando Fee 32D	03721356	03/10/16	03/11/16	Azra Kargar	05/10/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32E	03721321	09/22/16	10/04/16	AJ Alshammasi	10/07/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 32F	03721313	09/22/16	09/27/16	AJ Alshammasi	10/05/16	07/19/16	07/21/16	AJ Alshammasi				07/19/16	07/26/16	AJ Alshammasi	07/21/16	07/21/16	AJ Alshammasi	07/22/16	10/05/16	09/17/16	10/05/16		Passed All Tests
Fernando Fee 32G	03730374	04/04/16	04/11/16	AJ Alshammasi	05/03/16	09/18/14	07/26/16	AJ Alshammasi	07/28/16	08/09/16	AJ Alshammasi									08/03/16	09/28/16		Passed All Tests
Fernando Fee 32H	03730456	04/04/16	04/07/16	AJ Alshammasi	04/08/16	07/26/15	08/02/16	AJ Alshammasi	07/26/16	08/09/16	AJ Alshammasi									08/03/16	09/28/16		Passed All Tests
Fernando Fee 33	03700687	04/04/16	04/05/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 34A	03722044	03/09/16	03/11/16	Azra Kargar	05/03/16																	Rig	Taken Out of Operation (Plugged & Isolated)
Fernando Fee 34BR	03722302	03/09/16	03/11/16	Azra Kargar	03/18/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35A	03721457	03/21/16	03/22/16	AJ Alshammasi	03/28/16	08/18/16	08/24/16	AJ Alshammasi	08/12/16	08/24/16	AJ Alshammasi	08/18/16	08/24/16	AJ Alshammasi	08/13/16	08/24/16	AJ Alshammasi	08/19/16	09/13/16	09/12/16	09/13/16		Passed All Tests
Fernando Fee 35B	03721458	03/22/16	03/23/16	AJ Alshammasi	03/28/16				07/14/16	08/02/16	AJ Alshammasi												Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35C	03721279	03/11/16	03/14/16	Azra Kargar	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35D	03721453	03/22/16	03/24/16	AJ Alshammasi	03/28/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 35E	03721278	04/04/16	04/05/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Fernando Fee 38A	03724230	03/11/16	03/17/16	Azra Kargar	03/28/16	05/11/16	05/13/16	AJ Alshammasi	05/04/16	06/08/16	AJ Alshammasi	05/01/16	05/17/16	AJ Alshammasi	05/04/16	05/24/16	AJ Alshammasi	05/07/16	06/14/16	06/02/16	06/14/16		Passed All Tests
Fernando Fee 38B	03724231	03/11/16	03/15/16	Azra Kargar	03/18/16	04/16/16	05/06/16	AJ Alshammasi	04/18/16	05/17/16	AJ Alshammasi	04/16/16	04/16/16	AJ Alshammasi	04/18/16	05/17/16	AJ Alshammasi	04/19/16	06/14/16	04/28/16	06/14/16		Passed All Tests
Fernando Fee 38C	03724232	03/10/16	03/17/16	Azra Kargar	03/18/16	03/22/16	06/09/16	AJ Alshammasi	03/23/16	07/07/16	AJ Alshammasi	03/22/16	03/28/16	Jovy Kroh	03/23/16	06/21/16	AJ Alshammasi	03/25/16	07/08/16	04/12/16	07/08/16		Passed All Tests
Frew 2	03700665	06/10/16	06/14/16	AJ Alshammasi	06/20/16																		Taken Out of Operation (Plugged & Isolated)
Frew 4	03700667	04/08/16	04/13/16	AJ Alshammasi	04/19/16																	Rig	Taken Out of Operation (Plugged & Isolated)
Frew 5	03700668	09/15/16	10/14/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Frew 6	03700669	04/08/16	04/13/16	AJ Alshammasi	04/19/16																		Taken Out of Operation (Plugged & Isolated)
Frew 7	03700670	06/08/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Frew 8	03700671	03/25/16	03/28/16	AJ Alshammasi	03/31/16																		Taken Out of Operation (Plugged & Isolated)
Mission Adrian 1A	03721891	03/22/16	03/24/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Mission Adrian 1B	03721892	09/19/16	10/05/16	AJ Alshammasi	10/07/16																		Taken Out of Operation (Plugged & Isolated)
Mission Adrian 3	03700693	03/05/16	04/07/16	AJ Alshammasi	04/08/16	08/17/16	09/08/16	AJ Alshammasi				08/06/16	09/08/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 12	03700701	09/28/16	10/14/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Porter 24A	03724143	03/23/16	03/24/16	AJ Alshammasi	05/03/16	09/23/16	10/03/16	AJ Alshammasi	09/21/16	10/03/16	AJ Alshammasi	09/23/16	10/03/16	AJ Alshammasi	09/21/16	10/03/16	AJ Alshammasi	09/17/16	10/13/16	10/11/16	10/13/16		Passed All Tests
Porter 24B	03724144	03/23/16	03/24/16	AJ Alshammasi	05/03/16	05/19/16	05/23/16	AJ Alshammasi	05/16/16	06/25/16	AJ Alshammasi	05/19/16	05/23/16	AJ Alshammasi	05/16/16	06/25/16	AJ Alshammasi	07/14/16	07/29/16	07/22/16	07/29/16		Passed All Tests
Porter 25R	03700712	04/12/16	04/14/16	AJ Alshammasi	04/08/16	04/29/16	05/06/16	AJ Alshammasi	04/28/16	05/17/16	AJ Alshammasi	04/29/16	05/17/16	AJ Alshammasi	04/28/16	05/06/16	AJ Alshammasi	04/27/16	05/18/16	05/13/16	05/18/16		Passed All Tests
Porter 26	03700713	03/17/16	03/21/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Porter 26A	03721362	10/03/16	10/14/16	AJ Alshammasi		08/10/16	08/24/16	AJ Alshammasi	08/05/16	08/24/16	AJ Alshammasi	08/10/16	08/24/16	AJ Alshammasi	08/31/16	09/08/16	AJ Alshammasi	08/19/16					Taken Out of Operation (Plugged & Isolated)
Porter 26B	03721357	03/21/16	03/22/16	AJ Alshammasi	06/07/16																		Taken Out of Operation (Plugged & Isolated)
Porter 26C	03721353	03/31/16	04/05/16	AJ Alshammasi	04/07/16				07/11/16	07/21/16	AJ Alshammasi				07/09/16	07/21/16	AJ Alshammasi	10/10/16				Rig	Pending Test Results
Porter 26D	03721320	03/18/16	03/21/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Porter 26E	03721319	10/03/16	10/17/16	AJ Alshammasi					08/31/16						09/01/16								Taken Out of Operation (Plugged & Isolated)
Porter 30	03700717	03/29/16	03/30/16	AJ Alshammasi	04/01/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32	03700719	03/23/16	03/24/16	AJ Alshammasi	05/03/16	10/18/16	10/20/16	AJ Alshammasi				10/18/16	10/20/16	AJ Alshammasi								Rig	Pending Test Results
Porter 32A	03721277	03/23/16	03/24/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32B	03721276	03/24/16	03/27/16	AJ Alshammasi	05/12/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32C	03721360	03/25/16	03/28/16	AJ Alshammasi	05/12/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32D	03721355	03/28/16	03/30/16	AJ Alshammasi	05/19/16																		Taken Out of Operation (Plugged & Isolated)
Porter 32E	03721363	03/28/16	03/30/16	AJ Alshammasi	05/19/16							09/20/16	10/18/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 32F	03721354	03/24/16	03/27/16	AJ Alshammasi	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Porter 34	03700721	03/28/16	03/29/16	AJ Alshammasi	03/30/16																		Taken Out of Operation (Plugged & Isolated)
Porter 35	03700722	04/07/16	04/11/16	AJ Alshammasi	05/23/16	01/23/16	03/08/16	Jovy Kroh	02/26/16	03/08/16	Jovy Kroh	01/23/16	03/08/16	Jovy Kroh	02/26/16	06/21/16	AJ Alshammasi			03/01/16			Taken Out of Operation (Plugged & Isolated)
Porter 36	03700723	06/01/16	06/06/16	AJ Alshammasi	06/20/16	01/19/16	06/21/16	AJ Alshammasi				01/19/16	03/10/16	Jovy Kroh	01/25/16	06/21/16	AJ Alshammasi	01/21/16		02/01/16			Taken Out of Operation (Plugged & Isolated)
Porter 37	03700724	03/29/16	03/30/16	AJ Alshammasi	06/07/16																		Taken Out of Operation (Plugged & Isolated)
Porter 37A	03722046	03/28/16	03/29/16	AJ Alshammasi	03/30/16																	Rig	Pending Test Results
Porter 38	03700725	03/18/16	03/21/16	Azra Kargar	10/11/16																		Taken Out of Operation (Plugged & Isolated)
Porter 39	03700726	04/05/16	04/07/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Porter 40	03700727	04/05/16	04/07/16	AJ Alshammasi	04/08/16							08/12/16	09/08/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 42A	03721876	03/24/16	03/28/16	AJ Alshammasi	03/31/16							09/22/16	10/18/16	AJ Alshammasi									Taken Out of Operation (Plugged & Isolated)
Porter 42B	03721877	03/31/16	04/05/16	AJ Alshammasi	04/07/16	05/20/16	06/21/16	AJ Alshammasi	05/25/20	06/13/16	AJ Alshammasi	05/26/16	06/05/16	AJ Alshammasi	05/25/16	06/13/12	AJ Alshammasi	05/27/16					Taken Out of Operation (Plugged & Isolated)
Porter 42C	03721878	03/24/16	03/28/16	AJ Alshammasi	03/31/16																	Rig	Taken Out of Operation (Plugged & Isolated)
Porter 44	03700731	04/19/16	04/20/16	AJ Alshammasi	05/19/16	02/29/16	03/07/16	Jovy Kroh	02/15/16	03/07/16	Jovy Kroh	02/16/16	03/07/16	Jovy Kroh	02/25/16	03/07/16	Jovy Kroh	02/18/16	03/14/16	03/14/16	04/12/16		Passed All Tests
Porter 45	03700732	03/29/16	03/30/16	AJ Alshammasi	04/01/16																		Taken Out of Operation (Plugged & Isolated)
Porter 46	03700733	04/12/16	04/15/16	AJ Alshammasi	05/23/16																		Taken Out of Operation (Plugged & Isolated)
Porter 47	03700734	03/29/16	03/30/16	AJ Alshammasi	04/01/16																		Taken Out of Operation (Plugged & Isolated)

Porter 50B	03724336	03/08/16	03/11/16	Azra Kargar	05/03/16	04/14/16	05/06/16	AJ Alshammasi	04/16/16	05/17/16	AJ Alshammasi	04/14/16	05/17/16	AJ Alshammasi	04/15/16	05/06/16	AJ Alshammasi	04/18/16	06/09/16	04/29/16	06/09/16		Passed All Tests
Porter 50C	03724337	03/08/16	03/11/16	Azra Kargar	03/18/16	03/16/16	05/06/16	AJ Alshammasi	03/17/16	03/20/16	AJ Alshammasi	03/16/16	03/20/16	AJ Alshammasi	03/17/16	03/21/16	Jovy Kroh	03/20/16	04/20/16	04/06/16	04/20/16		Passed All Tests
Porter 68A	03722742	03/10/16	03/11/16	Azra Kargar	03/17/16	05/24/16	06/05/16	AJ Alshammasi	05/26/16	06/05/16	AJ Alshammasi	05/24/16	06/05/16	AJ Alshammasi	05/25/16	06/08/16	AJ Alshammasi	05/21/16	06/28/16	06/10/16	06/28/16		Passed All Tests
Porter 68B	03724136	03/31/16	04/05/16	AJ Alshammasi	04/07/16	04/13/16	05/06/16	AJ Alshammasi	04/14/16	05/17/16	AJ Alshammasi	04/16/16	05/17/16	AJ Alshammasi	04/14/16	05/06/16	AJ Alshammasi	04/15/16	06/02/16	04/25/16	06/02/16		Passed All Tests
Porter 69A	03722051	03/14/16	03/17/16	Azra Kargar	03/17/16																		Taken Out of Operation (Plugged & Isolated)
Porter 69B	03724127	03/14/16	03/17/16	Azra Kargar	03/17/16	04/05/16	05/06/16	AJ Alshammasi	04/04/16	05/17/16	AJ Alshammasi	04/05/16	05/17/16	AJ Alshammasi	04/04/16	05/11/16	AJ Alshammasi	04/06/16	06/10/16	04/19/16	06/10/16		Passed All Tests
Porter 69C	03724128	03/15/16	03/17/16	Azra Kargar	03/17/16	07/15/16	07/21/16	AJ Alshammasi	07/09/16	07/21/16	AJ Alshammasi	07/15/16	07/21/16	AJ Alshammasi	07/08/16	07/21/16	AJ Alshammasi	07/11/16	08/03/16	07/27/16	08/03/16		Passed All Tests
Porter 69D	03724130	03/20/16	03/22/16	AJ Alshammasi	03/24/16	05/24/16	06/03/16	AJ Alshammasi	05/21/16	06/05/16	AJ Alshammasi	05/24/16	06/05/16	AJ Alshammasi	06/10/16	06/14/16	AJ Alshammasi	05/20/16	06/14/16	06/08/16	06/14/16		Passed All Tests
Porter 69E	03724138	03/16/16	03/21/16	Azra Kargar	05/03/16	09/07/16	09/19/16	AJ Alshammasi	08/31/16	09/08/16	AJ Alshammasi	09/07/16	09/19/16	AJ Alshammasi	09/01/16	09/08/16	AJ Alshammasi	09/02/16	10/03/16	09/20/16	10/03/16		Passed All Tests
Porter 69F	03724226	03/16/16	03/21/16	Azra Kargar	03/22/16	05/07/16	05/17/16	AJ Alshammasi	04/06/16	06/30/16	AJ Alshammasi	04/07/16	05/17/16	AJ Alshammasi	04/06/16	05/17/16	AJ Alshammasi	04/08/16	06/30/16	04/22/16	06/30/16		Passed All Tests
Porter 69G	03724225	03/14/16	03/17/16	Azra Kargar	03/17/16	08/08/16	08/24/16	AJ Alshammasi	08/03/16	08/24/16	AJ Alshammasi	08/08/16	08/24/16	AJ Alshammasi	08/04/16	08/24/16	AJ Alshammasi	08/05/16	08/31/16	08/18/16	08/31/16		Passed All Tests
Porter 69H	03724223	03/17/16	03/21/16	Azra Kargar	05/04/16	06/11/16	06/14/16	AJ Alshammasi	06/17/16	06/23/16	AJ Alshammasi	06/11/16	06/14/16	AJ Alshammasi	06/13/16	06/23/16	AJ Alshammasi	06/09/16	07/05/16	06/22/16	07/05/16		Passed All Tests
Porter 69J	03724224	04/23/16	04/25/16	AJ Alshammasi	06/10/16	03/31/16	05/06/16	AJ Alshammasi	03/31/16	05/17/16	AJ Alshammasi	03/31/16	05/17/16	AJ Alshammasi	04/02/16	05/11/16	AJ Alshammasi	04/05/16	06/20/16	04/29/16	06/20/16		Passed All Tests
Porter 69K	03724236	03/20/16	03/22/16	AJ Alshammasi	05/04/16	05/22/16	05/24/16	AJ Alshammasi	05/24/16	06/09/16	AJ Alshammasi	05/22/16	05/24/16	AJ Alshammasi	05/24/16	06/09/16	AJ Alshammasi	05/18/16	07/08/16	07/07/16	07/08/16		Passed All Tests
Porter 72A	03724145	03/11/16	03/15/16	Azra Kargar	04/04/16	05/18/16	05/24/16	AJ Alshammasi	05/19/16	06/13/16	AJ Alshammasi	05/18/16	05/24/16	AJ Alshammasi	05/19/16	06/13/16	AJ Alshammasi	05/14/16	08/30/16	08/29/16	08/30/16		Passed All Tests
Porter 72B	03724146	03/21/16	03/23/16	AJ Alshammasi	05/04/16	06/28/16	07/07/16	AJ Alshammasi	06/29/16	07/07/16	AJ Alshammasi	06/28/16	07/07/16	AJ Alshammasi	06/29/16	07/07/16	AJ Alshammasi	06/24/16	08/08/16	08/04/16	08/08/16		Passed All Tests
Porter Sesnon 42	03700753	04/19/16	04/21/16	AJ Alshammasi	06/08/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 1	03700647	09/20/16	10/07/16	AJ Alshammasi	10/07/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 2	03700648	09/27/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 3	03700649	04/21/16	04/23/16	AJ Alshammasi	05/06/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 4	03700650	04/11/16	04/13/16	AJ Alshammasi	04/19/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 5	03700651	04/18/16	04/21/16	AJ Alshammasi	07/08/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 6	03700652	09/27/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 7	03700653	07/13/16	07/18/16	AJ Alshammasi	07/29/16																		Taken Out of Operation (Plugged & Isolated)
Sesnon Fee 8	03700654	04/25/16	04/27/16	AJ Alshammasi	06/07/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 02	03700755	06/07/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 03H	03700756	06/09/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 04	03700757	04/14/16	04/19/16	AJ Alshammasi	06/08/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 04A	03721375	04/18/16	04/19/16	AJ Alshammasi	05/09/16													09/19/16					Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 04B	03730460	09/10/16	09/12/16	AJ Alshammasi	09/13/16	08/15/16	08/25/16	AJ Alshammasi	08/19/16	08/25/16	AJ Alshammasi	08/15/16	08/25/16	AJ Alshammasi	08/17/16	08/25/16	AJ Alshammasi	08/23/16	09/08/16	09/02/16	09/08/16		Passed All Tests
Standard Sesnon 04-O	03722063	04/23/16	04/26/16	AJ Alshammasi	05/19/16										09/16/16								Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 05	03700758	04/19/16	04/19/16	AJ Alshammasi	05/03/16																	Rig	Pending Test Results
Standard Sesnon 06	03700759	04/21/16	04/23/16	AJ Alshammasi	05/06/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 09	03700762	06/06/16	06/08/16	AJ Alshammasi	06/14/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 10	03700040	06/02/16	06/10/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 11	03700763	04/13/16	04/14/16	AJ Alshammasi	05/24/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 12	03700764	04/20/16	04/23/16	AJ Alshammasi	05/03/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 13	03700765	04/06/16	04/11/16	AJ Alshammasi	04/11/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 14	03700766	09/23/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 16	03700768	04/06/16	04/11/16	AJ Alshammasi	04/11/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 17	03700769	09/19/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 24	03700775	04/13/16	04/14/16	AJ Alshammasi	05/24/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 25	03700776	04/08/16																					Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 25A	03721322	07/24/16	07/27/16	AJ Alshammasi	07/29/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 25B	03721323	07/24/16	07/27/16	AJ Alshammasi	07/29/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 29	03700041	06/09/16	06/11/16	AJ Alshammasi	06/13/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 30	03700780	09/29/16	10/17/16	AJ Alshammasi																			Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 31	03700781	04/06/16	04/07/16	AJ Alshammasi	04/08/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 44A	03721455	04/13/16	04/14/16	AJ Alshammasi	05/24/16																		Taken Out of Operation (Plugged & Isolated)
Standard Sesnon 44B	03721361	04/14/16	04/19/16	AJ Alshammasi	05/09/16																		Taken Out of Operation (Plugged & Isolated)
Ward 3	03700192	04/01/16	04/05/16	AJ Alshammasi	Failed N/T	09/02/16	09/19/16	AJ Alshammasi				07/11/16										Rig	Taken Out of Operation (Plugged & Isolated)
Ward 3A	03722306	04/01/16	04/05/16	AJ Alshammasi	04/07/16																		Taken Out of Operation (Plugged & Isolated)

N/T Total # Submittals=	113
N/T Total # Approved=	102
N/T Total # Ran=	114
N/T Total # Failure=	2
Failure due to Temp=	0
Failure due to Noise=	0
USIT Total # Submittals=	36
USIT Total # Ran=	36
CsgInsp Total # Submittals=	33
CsgInsp Total # Ran=	34
CBL Total # Submittals=	36
CBL Total # Ran=	37
Caliper Total # Submittals=	32
Caliper Total # Ran=	34
Block Test Total # Tests=	32
Block Test Total # Approvals=	26
A/T Test Total # Tests=	31
A/T Test Total # Approvals=	28
Total # Passed All Tests=	28
Total # Pending Test Results=	5
Total # Plugged and Abandoned=	0
Total # Taken Out of Operation=	81

Current Rig	Current Well	Next Well (Plan)	Move Date (Plan)
Ensign 333	Porter 50A	TBD	TBD
Ensign 334	Frew 4	Standard Sesnon 4-O	October 25, 2016
Ensign 335	Fernando Fee 32C	Fernando Fee 32B	October 22, 2016
Ensign 341	Standard Sesnon 5	Fernando Fee 35C	November 1, 2016
Ensign 342	Porter 26C	Porter 26A	October 30, 2016
Ensign 343	Fernando Fee 34A	Fernando Fee 34BR	November 15, 2016
Ensign 346	Porter 32	Porter 32B	November 7, 2016
Ensign 347	Porter 42C	TBD	December 1, 2016
Rival 6	Porter 37A	TBD	November 10, 2016
Rival 15	Ward 3	Ward 3A	December 15, 2016
Total # of Rigs	**10**		

Final Report

HR Vertilog Inspection Survey

Conducted for:

Southern California Gas Company

Aliso Canyon
Frew 2

Run date: October 20, 2014
Report date: October 22, 2014

Baker Hughes Wireline Systems
180 Childers Run Crossing
Buckhannon, West Virginia 26201

District Manager: Thomas Dowell
Tel. (304) 472 - 2460

Analysis Manager: Brian Lundy / Brent Harbstreit
Tel. (713) 879 - 1506

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Attachments

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Executive Summary

On October 20, 2014, BHI Wireline Services, operating from Buckhannon WV completed a HR Vertilog magnetic flux leakage (MFL) casing inspection survey on the Southern California Gas Company Aliso Canyon Frew 2.

A total of 91 individual joints of casing were identified during the inspection survey. Within this report, the term "casing" is intended to mean the downhole tubulars which are the subject of the survey, and which may include well casings, liners or production tubing.

A total of 1976 metal loss features exceeding the 15% reporting threshold were identified during the HR Vertilog survey. Of the 1976 total metal loss features, 14 were identified as internal features, and 1962 were identified as external features.

A total of 3 metal loss features exhibited predicted depths exceeding 80% of wall thickness. The maximum depth among all metal loss features was 87%. Any metal loss features of 80% or greater body wall loss will have a 0 PSI burst pressure rating and should be considered to have possible total or near total body wall penetration.

A total of 3 metal loss features exhibited ERF values exceeding 1.0. The maximum ERF among all metal loss features was 1.500.

This Final Report is intended to serve as an overall summary of the inspection results. The accompanying InSight Data CD contains a comprehensive Feature List which represents the complete findings of the HR Vertilog casing survey.

Evaluation Comments

-0.66 ft Hardware - External casing head response.
477.31 ft Hardware - Bottom of 13 3/8" external casing.

The well records provided were used for the determination of where there were casing weight and grade changes. However, the average axial background did not seem to change in the N-80 pipe grade sections and appear to be in the J-55 pipe grade. There could be some overstatement of the burst pressures if there is J-55 casing sections in the areas designated as N-80.

There were several features detected within the connections. The metal mass change of the connections could have an adverse effect on the metal loss calculations of these features.

The area around 2835 ft may have total penetration based upon the discriminator responses.

In addition to the features that classed and reported, there were a significant amount of features present below the threshold throughout the survey.

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1. Job Information

BHI Wireline Services completed a HR Vertilog casing inspection survey on the Southern California Gas Company Frew 2 on October 20, 2014. The job parameters are summarized in the following well, service and equipment data tables.

1.1. Well Data

The following well data and casing records were provided by representatives of Southern California Gas Company.

Table 1. Well Data

Well Identification					
Company	Southern California Gas Company				
Well	Frew 2				
Field	Aliso Canyon				
County/Parish	Los Angeles				
State/Province	California	**Country**			
API Number		**Location**			
Section	N/A	**Township**	N/A	**Range**	N/A
Elevations					
Kelly Bushing	0.00 feet				
Drilling Floor	0.00 feet				
Ground/Sea Floor	0.00 feet				
Permanent Datum Is	G.L.	**Permanent Datum Elevation**	2796.00 feet		
Log Measured From	G.L.	**Height Above Datum**	0.00 feet		
Drilling Measured From	G.L.	**Height Above Datum**	0.00 feet		
Borehole Information					
Fluid	8.5 KCL	**Wellhead Pressure**	0 psi	**Well Depth**	8120.00 feet
Casing Record					
Size	**Weight**	**Grade**	**From**	**To**	**Length**
7.000 in	26.0 lb/ft	N-80	0.00 ft	47.00 ft	47.00 ft
7.000 in	23.0 lb/ft	N-80	47.00 ft	1732.00 ft	1685.00 ft
7.000 in	23.0 lb/ft	J-55	1732.00 ft	5485.00 ft	3753.00 ft
7.000 in	28.0 lb/ft	J-55	5485.00 ft	6531.00 ft	1046.00 ft
7.000 in	30.0 lb/ft	J-55	6531.00 ft	8850.00 ft	2319.00 ft
13.375 in	48.0 lb/ft		0.00 ft	501.00 ft	501.00 ft

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1.2. Service Data

The BHI Wireline Services field services are summarized in the table below.

Table 2. Service Data

Service Information	
Job Date	October 20, 2014
Service Order	US091691
Recorded By	Grant Riffle
Witnessed By	Tom Egbert
Service Location	Buckhannon WV
Service Unit Number	4225
Logging Information	
Service	
Bottom Logged Interval	8100.00 feet
Top Logged Interval	-5.00 feet
Additional Services	
Remarks:	

1.3. Pressure Calculations

The following information was provided by Southern California Gas Company for use in pressure calculations.

Pressure Calculations:	
Burst Pressure Calculation	Modified B31G
Interaction Criteria	RP0102 - Fixed BW Ratio 6.0T x 6.0T

1.4. Equipment Data

The following BHI Wireline Services equipment assets were utilized in the performance of the inspection services.

Table 3. Equipment Data

Equipment Data	
Tool Series Number	7 to 9-5/8 Inch HRVRT 96 FL + 96 DIS Tool
Electronics Series Number	MuxDB
Interface Panel Series Number	4921
Calibration Reference Number	

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From: Razavi, Avideh
Sent: Friday, December 19, 2014 5:17 PM
To: Schroeder, Tom
Subject: SIMP Draft Response

Hi Tom,

I used some of TIMP/DIMP language to formulate a very general response. I'll be diving into writing the plan with Amy's help using the DIMP and TIMP format. We can discuss and elaborate on each bullet point / chapter of SIMP in our monthly meetings that way everyone can chime in. please let me know if you have any comments or suggestions.

- Alignment with Industry Practices and Benchmarking:
  - The Storage Integrity Management Program is intended for existing gas storage wells only. The integrity assessment is designed to fit location and is well specific due to the diverse geological formation.(we can include a few examples to show the difference between each well and each field and a comparison to other wells in other states if necessary).
  - Schlumberger is working with other Natural Gas Storage Fields within the US to implement a similar program (Well Integrity Management). SoCal Gas will meet with Schlumberger in early 2015 to utilize their expertise.

- Threat Identification & Risk Assessment:

  - Storage is in the process of identifying the main threat categories and developing a risk assessment matrix and methodology similar to TIMP. This methodology provides a framework for the consistent application of threat specific identification criteria. These criteria integrate both casing data and engineering judgment to systematically determine whether or not a threat exists for a given well casing.

  - The effectiveness of the matrix will be tested on wells that have been already assessed (i.e. Frew 2). Once the matrix is complete a baseline assessment plan and consequently the integrity assessment will be established.

  - As the integrity management program matures, much of the detailed data will be gathered on a routine basis and stored in a database to facilitate integrated analysis. A priority will be placed on all data which is required to perform the threat identification and risk assessment. Additional data gathering occurs throughout the year during the pre-assessment and assessment phase for each integrity assessment.

- Preventative & Mitigation measures (P&M):
  - The P&M options include those measures already implemented and any additional measures that may be required to improve the effectiveness of the current maintenance program and/or reduce the probability and consequence of failure. (i.e. SSSV for wells susceptible to land slide, derate pressure).
- Remediation:

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SED SUR REPLY 001865

    - Anomalous conditions discovered through integrity assessment that could reduce the integrity of the casing will be remediated or mitigated. (i.e. squeeze cement and derate pressure)
- Record Keeping:
    - The storage and ready access to important records is an essential part of the Storage Integrity Management Program. Depending on the type of data, there are systems currently in place that are used to store and retrieve information such as well historical data, maps, and operating history. Appropriate personnel have access to the information as needed. Efforts are underway to improve these systems and provide a more useful tool for the Integrity Management purposes.

Avi Razavi
Southern California Gas Company
Storage Engineering – Field Engineer
Aliso Canyon Station
Office: (818) 701-3389
Cell: [redacted]

I1906016_SCG_SED_DR_01_0000059
SED SUR REPLY 001869

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PUC Section 583, GO 66-D, and D.17-09-023

Message

From: Bomberger, Timothy J. [/O=ENOVA/OU=SOCAL/CN=RECIPIENTS/CN=TPTJB]
Sent: 12/22/2015 8:18:17 AM
To: Selga, Frank S. [/o=ENOVA/ou=SOCAL/cn=Recipients/cn=TP1FSS]
Subject: RE: Staffing Changes Within Storage in Response to SS-25

Any time you want to hang out, you know where to find me!

Tim Bomberger

Storage Operations Mgr, Montebello

Office: 310 578-2680

[redacted]

From: Selga, Frank S.
Sent: Monday, December 21, 2015 9:41 AM
To: Bomberger, Timothy J.
Subject: Fwd: Staffing Changes Within Storage in Response to SS-25

Congrats Tim! Let's talk sometime

Sent from my iPhone

Begin forwarded message:
From: "Hamze, Firas" <FHamze@semprautilities.com>
Date: December 21, 2015 at 7:38:08 AM PST
To: "Aguilar, Richard" <RAguilar2@semprautilities.com>, "Azizian, Nick" <NAzizian@semprautilities.com>, "Bomberger, Ana M" <ABomberger@semprautilities.com>, "Briones, Marcelino G" <MBriones@semprautilities.com>, "Basto, Carlos E" <CBasto@semprautilities.com>, "Du, Tom" <PDu@semprautilities.com>, "Eldridge, Patrick" <PEldridge@semprautilities.com>, "Gallandt, Steven C" <SGallandt@semprautilities.com>, "Gregorian, Karineh" <KGregorian@semprautilities.com>, "Guzman, Steven" <SGuzman@semprautilities.com>, "Hoo, John" <JHoo@semprautilities.com>, "Kao, Tony K" <TKao@semprautilities.com>, "Mansour, Marianne N" <MMansour@semprautilities.com>, "Mikhailpoor, Misha E" <MMikhailpoor@semprautilities.com>, "Pacheco, Maritza" <MPacheco@semprautilities.com>, "Rahman, Mushfiqur" <MRahman@semprautilities.com>, "Sampson, Karin C" <KSampson@semprautilities.com>, "Selga, Frank S." <FSelga@semprautilities.com>, "Shahbaz, Henry" <HShahbaz@semprautilities.com>, "Thompson, John C." <JCThompson@semprautilities.com>, "Azzam, Tarek" <TAzzam@semprautilities.com>, "Malinoski, Brock A" <BMalinoski@semprautilities.com>
Cc: "Quon, Lissa" <LQuon@semprautilities.com>
Subject: FW: Staffing Changes Within Storage in Response to SS-25

Hi Team,

Below are some staffing changes that has been made within storage to support the SS25 incident at Aliso. As you can see, my duties have been temporally reassigned to Aliso and Lissa Quon will be returning to storage to fill behind me as the TSM. Please let me know if you have any questions,

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PUC Section 583, GO 66-D, and D.17-09-023

Firas

From: Baker, Phil E.
Sent: Sunday, December 20, 2015 6:15 PM
To: La Fevers, Glenn; Mumford, Joel; Wiegman, Edward; Thompson, John A.; Bomberger, Timothy J.; Kitson, Amy; Neville, Dan; Aftab, Nadia; Quon, Lissa; Hamze, Firas; McMahon, Thomas D.; McClure, Gloria; Jackle, Charles
Cc: Furgerson, Scott P; Schneider, Douglas; Haines, Deanna; Prince, John B.; Garcia, John E.; Rawls, Wallace; Musich, Beth; Aspa, Jorge; Hayles, Leslie F.
Subject: Staffing Changes Within Storage in Response to SS-25

Team, the following staffing changes will be made within Storage immediately to assist with ongoing operations while also supporting the SS-25 incident at Aliso Canyon:

- Glenn la Fevers will be temporally relieved of his regular Aliso Canyon duties so he can focus on supporting Bret, Rodger and others responding to the SS-25 incident.
- Tim Bomberger will fill behind Glenn on a temporary basis. Tim will continue to support the Montebello operation remotely with assistance from Charles Jackle.
- Charles Jackle will also support Tom Egbert, and the initial SIMP activities at Aliso.
- Firas Hamze will be temporally relieved of his TSM duties so he can focus on supporting Glenn, Tim, and others at Aliso Canyon.
- Lissa Quon will return to Storage and fill behind Firas as the TSM on a temporary basis. *Welcome back Lisa!*
- Nadia Aftab will move into the SS-25 Incident Command Structure as the Planning Officer supporting Jimmie, Rodger, Bret and others.
- Tom McMahon will move into Storage reporting to me as the SIMP Project Manager.
  - Several individuals within Storage will be reassigned and report to Tom.
  - In addition, Tom will be quickly hiring Project Specialists, Reservoir Engineers, Technical Advisors, and Contract Administrators (both internally and externally).
  - Ramping-up SIMP throughout Storage is a high priority. I will be assisting Tom immediately in this effort.
  - More details of Tom's new organization will be announced over the next couple of weeks.
- Dan Neville will relocate to Aliso Canyon to focus on responding to SS-25 data requests while providing guidance, expertise, and support for SIMP and other Storage reservoir issues.
  - Dan's previous Goleta Native Gas responsibilities have been handed-off to Art Sanders and Ed Wiegman
  - Dan will continue to provide limited support to the Montebello initiative.
- Todd, Avi, Andy, and Hilary are directly supporting Bret and Rodger on the SS-25 incident.
- Amy and the rest of her remaining team are responding to data requests and supporting the Aliso operations as needed.

The situation at Aliso is fluid and other personnel reassignments and organizational changes may be necessary going forward.

I have transitioned off the SS-25 incident to focus on traditional Storage operations at Aliso and the other fields. Near term I will assist in ramping-up SIMP while continuing to support SS-25 on an as-needed basis.

Lastly, although there is a tremendous amount of activity surrounding SS-25, we cannot lose sight of the importance of the compliance and reliability functions at all of our fields. We must find a way to stay on top of our operations and responsibilities despite the personnel reassignments. I know I can count on your support.

Please contact me if you would like to discuss the employee moves or our go-forward plan in more detail. Thank you.

From: Razavi, Avideh
Sent: Friday, December 19, 2014 5:17 PM
To: Schroeder, Tom
Subject: SIMP Draft Response

Hi Tom,

I used some of TIMP/DIMP language to formulate a very general response. I'll be diving into writing the plan with Amy's help using the DIMP and TIMP format. We can discuss and elaborate on each bullet point / chapter of SIMP in our monthly meetings that way everyone can chime in. please let me know if you have any comments or suggestions.

- Alignment with Industry Practices and Benchmarking:
  - The Storage Integrity Management Program is intended for existing gas storage wells only. The integrity assessment is designed to fit location and is well specific due to the diverse geological formation.(we can include a few examples to show the difference between each well and each field and a comparison to other wells in other states if necessary).
  - Schlumberger is working with other Natural Gas Storage Fields within the US to implement a similar program (Well Integrity Management). SoCal Gas will meet with Schlumberger in early 2015 to utilize their expertise.

- Threat Identification & Risk Assessment:

  - Storage is in the process of identifying the main threat categories and developing a risk assessment matrix and methodology similar to TIMP. This methodology provides a framework for the consistent application of threat specific identification criteria. These criteria integrate both casing data and engineering judgment to systematically determine whether or not a threat exists for a given well casing.

  - The effectiveness of the matrix will be tested on wells that have been already assessed (i.e. Frew 2). Once the matrix is complete a baseline assessment plan and consequently the integrity assessment will be established.

  - As the integrity management program matures, much of the detailed data will be gathered on a routine basis and stored in a database to facilitate integrated analysis. A priority will be placed on all data which is required to perform the threat identification and risk assessment. Additional data gathering occurs throughout the year during the pre-assessment and assessment phase for each integrity assessment.

- Preventative & Mitigation measures (P&M):
  - The P&M options include those measures already implemented and any additional measures that may be required to improve the effectiveness of the current maintenance program and/or reduce the probability and consequence of failure. (i.e. SSSV for wells susceptible to land slide, derate pressure).
- Remediation:

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SED SUR REPLY 001870

    - Anomalous conditions discovered through integrity assessment that could reduce the integrity of the casing will be remediated or mitigated. (i.e. squeeze cement and derate pressure)
- Record Keeping:
    - The storage and ready access to important records is an essential part of the Storage Integrity Management Program. Depending on the type of data, there are systems currently in place that are used to store and retrieve information such as well historical data, maps, and operating history. Appropriate personnel have access to the information as needed. Efforts are underway to improve these systems and provide a more useful tool for the Integrity Management purposes.

Avi Razavi
Southern California Gas Company
Storage Engineering – Field Engineer
Aliso Canyon Station
Office: (818) 701-3389
Cell: [redacted]

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PUC Section 583, GO 66-D, and D.17-09-023

Storage Engineering 2014 Performance Goals

I. **Employee Safety**
   a. Aggressively manage safety to achieve zero OSHA, LTI, & CMVI's.
   b. Actively manage rig and associated contractor safety.

II. **System Reliability**
   a. Maintain the highest levels of well and reservoir reliability for gas injection, withdrawal and storage inventory.
      i. Develop and implement withdrawal recovery plans for Aliso Canyon and inventory recovery and maintenance plans for PDR.
      ii. Efficiently prioritize well work-overs and complete maintenance activities on schedule.
   b. Support community outreach efforts to mitigate public concerns surrounding storage field operations and major projects.

III. **Major Projects**
   a. GRC – Support Rate Case witness for Storage in the preparation of strong testimony and effectively respond to data requests.
   b. Well and Reservoir Upgrades – Successfully complete [redacted] budget comprising Storage Engineering capital projects on schedule.
   c. Goleta Native Gas – Support completion of one well and provide expertise and guidance as necessary to complete project by year end.
   d. 3DPM –Support successful design and testing of the enterprise-wide asset management solution for roll-out in Storage in 2015.

IV. **Operational Compliance and Well Integrity**
   a. Strive to achieve the highest levels of regulatory compliance.
      i. Satisfactorily address audit findings
   b. Develop and implement pilot Storage Integrity Management Plan (SIMP).

V. **Workforce Development**
   a. Ensure Storage Engineering vacancies are staffed with qualified internal and external candidates and expand organization for succession planning and SIMP Implementation.
   b. Implement a knowledge transfer plan for Storage Engineering.

VI. **Financial Performance**
   a. Achieve all reliability, operational, and project goals within Storage Engineering budget:
      [redacted]
   b. Support achievement of miscellaneous storage revenue goal of [redacted]

VII. **Personal Development**
   a. Continue to mentor new to Storage non-Petroleum engineering operations personnel on drilling, reservoir engineering and down-hole operations.

Confidential and Protected Materials Pursuant to
PUC Section 583, GO 66-D, and D.17-09-023

Message

From: Baker, Phil E. [/O=ENOVA/OU=SOCAL/CN=RECIPIENTS/CN=TPPEB]
Sent: 4/30/2015 2:37:00 PM
To: Lane, Bret [JLane@semprautilities.com]
CC: Cho, Jimmie I [JCho@semprautilities.com]; Furgerson, Scott P [SFurgerson@semprautilities.com]
Subject: Storage Update

Hello Bret. It's been a while since we have talked or corresponded so I thought I would pass along a brief status update of Storage.

Safety

- We had our first OSHA and LTI after going incident free for two successive quarters
  - An employee at PDR crushed his knuckle while working on well grating
- Working very well with Robin Downs and the Safety Committee

Financials

- 2015 O&M and Capital budgets are essentially at plan after factoring in timing
- YTD April miscellaneous revenues are $400k above plan
- Q1 shareholder loss at Montebello is $1.1 million, year-end Outlook is in the range of a $3 million loss

2016 GRC

- SIMP O&M and capital supported at 100% of request by ORA
  - ORA supports a one-way balancing account not the two-way mechanism that was requested
- 2016 "routine" capital supported at 100% of request by ORA
- "Routine" O&M was supported by ORA at $360k above 2014 actual
  - The reduced spending from 2014 actuals did not support our higher estimate which lowered the 5-year trend methodology used as a forecast

Special Projects

- The plan is to conduct a flow test of Todd 2 at Goleta this summer
- A recommendation to Scott on a future course of action for Montebello is pending
- Work is in progress on potentially selling one of our gas lines to be used as a conduit for oil transportation by others as part of their East Whittier development project
- Discussions of our interest and potential involvement in a new "Long reach" strategy/project are in progress
- MCAs to address the Procurement and Contracting Audit findings are in progress
  - Scott and I recently met with the Honor Rancho leadership team to discuss expectations, other site meetings will follow

Workforce

- Jim Mansdorfer will retire at the end of May
- Tom Schroeder plans to retire near the end of the year
- Employee turnover and new hiring is continuing consistent with our replacement planning strategy

Other Items

- Work is in the planning stages for two new wells at Aliso and another at Goleta in 2015
- Many capital projects in progress
  - Engineering support critical to achieving goals
- The SIMP "pilot project" is progressing well

Let me know if I should schedule some time where we can get "caught-up" and talk more in-depth. Otherwise I will just have to catch you in the hallway sometime!

CHAPTER 7
EXHIBITS

Message

From: Neville, Dan [DNeville@semprautilities.com]
Sent: 12/6/2015 10:36:36 AM
To: Schwecke, Rodger [RSchwecke@semprautilities.com]
CC: Baker, Phil E. [PBaker@semprautilities.com]; Kitson, Amy [AKitson@semprautilities.com]; Kargar, Azra [AKargar@semprautilities.com]; Lane, Bret [JLane@semprautilities.com]
Subject: Re: Identical Wellhead

There is a wellhead binder in Azra's office that should have an SS25 wellhead schematic. The valves may have been changed out but the dimensions should still be accurate.
A comparison will need to be made to find another well in the field with the same casing set up
I would look for wells drilled in the SS lease in the early 1950s

On Dec 6, 2015, at 10:13 AM, Schwecke, Rodger <RSchwecke@semprautilities.com> wrote:
I need a location where we have installed an identical wellhead as on SS25. B&C would like to be able to measure the wellhead as they are evaluating options to pull the gas off the location.

Rodger

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

Pre-Formal Inquiry into California Gas Management, Practices and Procedures Related To The Aliso Canyon Incident in October, 2015.

EXAMINATION UNDER OATH OF AVI RAZAVI AND AMY KITSON

CONFIDENTIAL
REPORTER'S TRANSCRIPT
San Francisco, California
September 25, 2018
Pages 1 - 189

Reported by: Karly Powers, CSR No. 13991
Jason Stacey, CSR No. 14092
Rebekah DeRosa, CSR No. 8708

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8 **AMY KITSON**

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1 BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE
2 STATE OF CALIFORNIA

3 PRE-FORMAL INQUIRY INTO CALIFORNIA GAS
MANAGEMENT, PRACTICES AND PROCEDURES RELATED
4 TO THE ALISO CANYON INCIDENT IN OCTOBER,
2015.
5
Appearances:
6 (Examination Under Oath, September 25, 2018)

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27

28

1 SAN FRANCISCO, CALIFORNIA
2 SEPTEMBER 25, 2018 - 10:08 a.m.
3 * * * * *
4 BE IT REMEMBERED THAT, by
5 (Subpoena/Notice/Consent of the Witness), and
6 on Tuesday, September 25, 2018, commencing at
7 the hour of 10:08 a.m. thereof, at the
8 offices of the CALIFORNIA PUBLIC UTILITIES
9 COMMISSION, 505 Van Ness Avenue, Room 4003,
10 San Francisco, California 94102, before JASON
11 STACEY, CSR No. 14092, KARLY POWERS CSR No.
12 13991, REBEKAH L. DE ROSA CSR No. 8708
13 personally appeared
14 **(AMY KITSON, AVI RAZAVI)**,
15 called as a witness herein, who, being first
16 duly sworn, was thereupon examined and
17 interrogated as hereinafter set forth.
18 * * * * *
19 EXAMINATION
20 BY MR. GRUEN:
21 Q All right. So let's go on the
22 record. And just as a matter of
23 introductions, if everyone could go around
24 and state our name and our titles and who we
25 work for just for the record?
26 So I'll start. My name is Darryl
27 Gruen. I'm staff counsel at the California
28 Public Utilities Commission, and I'm

1 representing the Safety and Enforcement
2 Division.
3 MR. BRUNO: Hi. I'm Ken Bruno. I'm a
4 program manager of the Safety and Enforcement
5 Division.
6 MR. SHER: Nicholas Sher Legal CPUC.
7 MS. CLORFEINE: Sabina Clorfeine,
8 assistant general counsel for Southern
9 California Gas Company.
10 MR. STODDARD: Jack Stoddard with
11 Morgan Lewis. Outside counsel for SoCalGas.
12 WITNESS RAZAVI: Avi Razavi SoCalGas
13 underground storage data management.
14 WITNESS KITSON: Amy Kitson director of
15 storage risk management for SoCalGas.
16 MR. GRUEN: Great. Okay. So as I
17 mentioned, I'm staff counsel with the Legal
18 Division. I'm joined by Mr. Bruno and
19 Mr. Sher here for Safety Enforcement
20 Division, and we're doing an Examination
21 Under Oath today.
22 Ms. Kitson, I remember you came to
23 do an Examination Under Oath very much like
24 what we're doing today. And so the
25 Examination Under Oath is like a deposition,
26 which is a question-and-answer period where
27 the court reporters will be transcribing --
28 taking exact notes of the words we say so

1 that we have a record of what we've talked
2 about today.
3 The difference between this and a
4 deposition is there is no underlying
5 proceeding right now. We don't know whether
6 we're going to do a full-on investigation.
7 We're still gathering facts, but we may use
8 this information later on if Safety and
9 Enforcement Division elects to do a formal
10 proceeding if they choose to do that.
11 Do you both understand that?
12 WITNESS KITSON: A Yes.
13 WITNESS RAZAVI: A Yes.
14 Q When I ask questions, it is
15 important that you provide truthful and
16 complete answers to them. Please answer my
17 questions directly. If you do not understand
18 my question either because I've not
19 articulated it well or because I phrased it
20 poorly, please either ask me to repeat it or
21 just say you did not understand the question.
22 Please do not speculate or guess about what
23 the question is. Do you understand that?
24 WITNESS KITSON: A Yes.
25 WITNESS RAZAVI: A Yes.
26 Q And did either of you receive a
27 subpoena to appear today?
28 WITNESS KITSON: A Our counsel.

1 Q Okay. So if I can circulate copies
2 of the subpoenas to counsel just to review
3 and see if those are accurate copies of what
4 we served upon counsel for Ms. Razavi and Ms.
5 Kitson to appear today.
6 MS. CLORFEINE: Yes.
7 MR. STODDARD: Yes.
8 MR. GRUEN: If we could use those, and
9 hand those as exhibits to the court reporter.
10 I'll ask that those be marked as Exhibits 1
11 and 2 respectfully.
12 Why don't we have Ms. Kitson's
13 subpoena marked as Exhibit 1. And
14 Ms. Razavi's subpoena marked as Exhibit 2.
15 COURT REPORTER: Can we go off the
16 record for a moment?
17 MR. GRUEN: Off the record.
18 (Off the record.)
19 MR. GRUEN: All right. Back on the
20 record.
21 You are here under -- Ms. Kitson,
22 Ms. Razavi, you are here under compulsion of
23 subpoena and witness fees. That means that
24 the Safety and Enforcement Division has a
25 statutory authority to issue the subpoena to
26 compel the attendance of employees of
27 Southern California Company to testify. And
28 also for Southern California Gas to produce

1 documents as part of our supervisorial
2 authority of our utilities including
3 SoCalGas.
4 This means you're not here
5 voluntarily and the information you provide
6 us is not voluntary. You're answering
7 questions because we require it. Do you
8 understand all that?
9 WITNESS KITSON: A Yes.
10 WITNESS RAZAVI: A Yes.
11 Q OKAY. Do you understand that
12 Southern California Gas Company is prohibited
13 from retaliating against you for reporting
14 unsafe conditions to the Safety and
15 Enforcement Division?
16 WITNESS KITSON: A Yes.
17 WITNESS RAZAVI: A Yes.
18 Q Do you have any questions about
19 what any of that means?
20 WITNESS KITSON: A No.
21 WITNESS RAZAVI: A No.
22 Q Has anyone spoken with you about
23 the topics identified in the subpoena that we
24 subpoenaed you for today?
25 WITNESS KITSON: A Just my counsel.
26 WITNESS RAZAVI: A Yes. Counsel.
27 Q For you as well? Thank you.
28 Has anyone coached or advised you

1 generally about goals to achieve coming in
2 here today?
3 WITNESS KITSON: A No.
4 WITNESS RAZAVI: A No.
5 Q Okay. Has anyone suggested, said,
6 or implied that you give answers today that
7 in any way protect Southern California Gas
8 Company?
9 WITNESS KITSON: A No.
10 WITNESS RAZAVI: A No.
11 Q Okay. All right. So, Ms. Kitson,
12 I think you answered most of these questions.
13 So what I'll attempt to do as best I can is
14 to flag the set of questions either by giving
15 you a topic area that I intend to ask
16 questions about or perhaps circulating an
17 exhibit that the questions will focus upon
18 for this Examination Under Oath.
19 So the first set of questions are
20 really focused on background. And,
21 Ms. Kitson, since I believe we asked
22 basically the gist of these questions of you
23 last time, this will be for -- these
24 questions will be for you, Ms. Razavi. We
25 won't duplicate our efforts from last time
26 around.
27 So, Ms. Razavi, if you would, what
28 is your current job title?

1 WITNESS RAZAVI: A Underground storage
2 data manager.
3 Q Okay. What is your role in that
4 title?
5 A I manage the governance of records
6 and data and managing the technology piece
7 databases. And I also have the compliance
8 reporting piece.
9 Q Okay. What was the effective date
10 of your current position approximately?
11 A May 2016.
12 Q Okay. And what was your
13 position -- let me ask this: How long have
14 you worked for Southern California Gas
15 Company?
16 A Since 2012.
17 Q 2012. What was your position prior
18 to your current one?
19 A Storage field engineer.
20 Q Storage field engineer. And what
21 were the approximate dates of that position?
22 A November 2014 to May 2016.
23 Q Okay. What was your role as
24 storage field engineer?
25 A So I was brought into the
26 underground storage team to help with
27 implementation of the Storage Integrity
28 Management Program. I managed projects

1 related to the storage Integrity Management
2 Program.
3 Q Okay. And which projects -- which
4 fields did you manage projects related to the
5 Storage Integrity Management Program about?
6 A The projects encompass all fields.
7 All storage fields.
8 Q All four of them for Southern
9 California Gas Company?
10 A Yes.
11 Q Okay. All right. And prior to
12 your role as storage field engineer, what
13 role did you play? What title did you have?
14 Excuse me.
15 A Engineer 1 with the Storage
16 Technical Services Group.
17 Q And what were the dates
18 approximately of you serving in that title?
19 A Late 2013 to November 2014.
20 THE COURT REPORTER: I need to have you
21 speak up. I need to be able to hear you.
22 A Sure.
23 MS. CLORFEINE: Do you want to go off
24 the record real quick?
25 MR. GRUEN: Sure.
26 (Off the record.)
27 MR. GRUEN: Back on the record.
28 Q And I think you mentioned if I

1 heard correctly, your title from late 2013 to
2 November 2014 was Engineer 1 of the Field
3 Technical Services Group? Did I get that
4 right?
5 WITNESS RAZAVI: A Storage Technical
6 Services Group.
7 Q Storage Technical Services Group.
8 Thank you. And what were your duties during
9 that time as Engineer 1?
10 A Managing projects for all four
11 storage fields.
12 Q Okay. Thank you. I think you said
13 you started with SoCalGas in 2012?
14 A Yes.
15 Q So you had a title prior to your
16 title as Engineer 1 of the Storage Technical
17 -- I'm sorry. The Storage Services --
18 A Engineer 1.
19 Q It was also Engineer 1. Okay.
20 A Just to clarify, I was Engineer 1
21 in the Storage Technical Services Group from
22 late 2013 to November 2014.
23 Q Okay.
24 A Before that I was Engineer 2 from
25 September 2012 to late 2013.
26 Q Okay. What was your -- what were
27 you duties as Engineer 2?
28 A Data management, managing data

1 management projects.
2 Q Was that your first title and your
3 first position for Southern California Gas
4 Company?
5 A As a full-time employee, yes.
6 Q What did you do prior to your
7 full-time status as Engineer 2?
8 A I was a contractor for Southern
9 California Gas Company through a third-party
10 company.
11 Q Okay. Thank you. What were the
12 dates that you worked as a contractor for
13 Southern California Gas Company through a
14 third party?
15 A They're broken. So I -- from, I
16 believe, it was August of 2011 to about
17 December, I was a pipeline integrity engineer
18 contractor. Then I worked for Schlumberger
19 for a short period from December 2011 to
20 February, March of 2012. Then I came back to
21 the gas company as, again, a pipeline
22 integrity engineer as a contractor in 2012 up
23 until September of 2012, and then I became a
24 full-time employee.
25 Q Okay. Thank you. And during your
26 time -- so sounds like before you came back
27 -- before you came to the gas company as a
28 pipeline integrity engineer in 2012, your

1 last role was with Schlumberger from
2 December 2011 to -- was it February or March?
3 A Sometime around there. I can't
4 remember.
5 Q Okay. Approximately February or
6 March 2012?
7 A Yes.
8 Q Understood. What was your role
9 working for Schlumberger at that time?
10 A I was an engineer in training for
11 the hydraulic fracturing crew.
12 Q Engineer in training, I'm sorry,
13 for?
14 A Hydraulic fracturing.
15 Q Okay. Thank you. And your role
16 from August 2011 to December 2011 as a
17 pipeline integrity engineer contractor, what
18 did you do? What were your duties at that
19 time?
20 A Data mining in an effort to
21 digitize records.
22 Q Okay. Thank you. Okay. That's
23 helpful. Thank you, Ms. Razavi.
24 If I may, the next sets of
25 questions are intended to ask about well
26 history and well history data. And I'll be
27 clarifying -- asking clarification questions
28 about what that means. But when I say,

1 "Data," it's generally intended to ask
2 questions about well history files and the
3 data within them. Things of that sort.
4 So with that in mind if you could
5 tell me, are you familiar with well history
6 files? With that term?
7 A I'm familiar with the definition of
8 well history --
9 Q Okay.
10 A -- form.
11 Q Of a well history form? What does
12 that term mean to you? What's your
13 understanding of that term?
14 A When there's a workover activity,
15 there are daily reports. Meaning the
16 activities are captured in a particular form
17 that we submit those reports into the
18 Division of Oil and Gas and Geothermal
19 Resources. And they refer to that as a Well
20 History Form.
21 Q Okay. What -- okay. So what
22 about -- does Southern California Gas Company
23 keep data regarding the history of its wells?
24 A Yes.
25 Q And what is the term? Is there an
26 overarching term that's used in order to
27 identify the well history data that's
28 Southern California Gas Company keeps?

1 A I don't understand your question.
2 Q Okay. I'm trying to search for a
3 term that I can use today in order to capture
4 as an overarching term of well history data
5 that Southern California Gas Company has.
6 Whether it be a repository for it. Whether
7 it be particular documents that are kept for
8 each well that shows Southern California Gas
9 Company the history of its well data.
10 So I think what I'm struggling with
11 is the terms that Southern California Gas
12 Company whether it's you working for Southern
13 California Gas Company would use as sort of a
14 shorthand to describe those things.
15 Is there anything that you can
16 identify? Any terms that you can identify
17 that we can use today in order to capture
18 those concepts?
19 A Sure. A well file --
20 Q Well file.
21 A -- would encompass records and data
22 for a well to route its design history,
23 operations, and maintenance.
24 Q Thank you. Great. So I'll do the
25 best I can to stay on point to use the term
26 well file when I'm referring to those things
27 containing records. Just to be sure I
28 understood correctly, maintaining records and

1 data for a well throughout design history,
2 operations, and maintenance?
3 A Yes.
4 Q Is there anything else to your
5 knowledge that is included in a well file?
6 A Planning for the design activities,
7 information, geological information,
8 pertinent records to a well operation.
9 Q Pertinent records for a well
10 operation. Okay. Understood. Thank you.
11 Planning for design activities,
12 does that include permits?
13 A Yes.
14 Q Okay. In terms of pertinent
15 records, just to clarify that term a little
16 bit, what sorts of pertinent records would
17 you expect to be included in a well file?
18 A Again, design, construction,
19 diagrams, operations, maintenance activities,
20 inspection activities from the inception of a
21 well to the time the well is abandoned.
22 Q Understood. Okay. What about
23 things like testing? Any test records?
24 A Yes. Part of inspections.
25 Q What other records would be part of
26 inspection?
27 A Tests, logs.
28 Q Okay. Anything else?

1 A To the best of my recollection,
2 that's it.
3 Q Okay. Thank you. Okay. And is
4 there a repository that keeps all of Southern
5 California Gas Company's well files? By
6 repository, I mean is there one place in
7 which all of them are kept?
8 A Are you referring to hard copy
9 digitized copies?
10 Q I appreciate the question. And
11 I'll get there as well. That's a good
12 question. If I could, why not start with
13 hard copy. Is there one place where all of
14 the well files are kept?
15 A What timeframe?
16 Q Yeah. Prior to October 23rd, 2015.
17 A Sure. The hard copy records are at
18 each storage facility. And there are
19 duplicate copies at the Aliso Canyon
20 facility. The duplicate copies are not kept
21 up to date.
22 Q So prior to -- I appreciate your
23 clarification. For now why not say that the
24 questions that I'm asking are intended to ask
25 about the state of the well files prior to
26 October 23rd, 2015 unless I specify
27 otherwise.
28 A Okay.

1 Q Yeah. All right. So with regards
2 to the hard copy records at Aliso, those are
3 all kept in one -- is there a file cabinet?
4 Or is there something by which all of the
5 well files are kept?
6 A Yes. They're file cabinets.
7 Q Okay. And there are duplicates at
8 each facility. But those aren't up to date I
9 understand you to say. So with regards to
10 the duplicates, why are those kept since
11 they're not up to date?
12 A I'm not -- I don't know the
13 history.
14 Q Okay. But you're aware that some
15 duplicate are kept?
16 A Yes.
17 Q Okay. How many duplicates have you
18 seen give or take?
19 A What field?
20 Q Yeah.
21 A What storage field?
22 Q I am sorry. I see your question.
23 Let's stay with Aliso. At the Aliso Canyon
24 Storage Facility. Does that answer your
25 question?
26 A I haven't seen the Aliso Canyon
27 Storage Facility's duplicates of well file
28 copies.

1 Q Okay. When you say "duplicates,"
2 generally are you saying -- are the
3 duplicates kept in one location? Like a file
4 cabinet similar to how the other hard copy
5 up-to-date records are kept?
6 A Yes.
7 Q They are. Okay. Are there any
8 duplicates that are also not kept in one
9 location?
10 A Not that I'm aware of.
11 Q Okay. And which facilities --
12 which storage facilities to your knowledge
13 have duplicates of the well files?
14 A As a point of clarification, the
15 duplicate copies are kept at the Aliso Canyon
16 Facilities for the other storage facilities.
17 Q Oh, I see. Okay. For all of them?
18 A I don't know if it's for all of
19 them.
20 Q Okay.
21 A But I've seen some.
22 Q Okay. I see. I follow. That's
23 helpful. Thank you.
24 And if we wanted to ask for well
25 files, the -- I'm struggling. I guess it's
26 terminology I'm struggling with. In order to
27 identify the well files that are not the
28 duplicates, what term should I use? Should I

1 call that the "master set"? What would be
2 the right term to call the repository or the
3 file cabinet where the current well files
4 are?
5 A Just the well file.
6 Q Yeah.
7 A Yeah.
8 Q Just the well file?
9 A Just the well file.
10 Q Okay. And if I wanted to refer to
11 the set of duplicates, I should just call it
12 the duplicate well file?
13 A Yes.
14 Q Okay. Understood. Okay. So
15 sticking with the date prior to October 23rd
16 2015, how had SoCalGas's well-history files
17 -- or excuse me well files -- been used as
18 part of SoCalGas's Storage Integrity
19 Management Program?
20 A For which field?
21 Q Aliso.
22 A Okay. So I had a project in early
23 2015, to digitize those records and
24 centralize them in a database. And that was
25 part of the Storage Integrity Management
26 Program.
27 Q Thank you. Ms. Kitson, do you want
28 to add anything to that in terms of from your

1 perspective and your role, how had SoCalGas's
2 well files been used as part of SoCalGas's
3 Storage Integrity Management Program prior to
4 October 23rd, 2015.
5 WITNESS KITSON: A So I just add on to
6 what Avi said that we are doing that in
7 preparation not only for some -- for getting
8 our data into an electronic format to further
9 provide clarity for identification and risk
10 assessment that we were planning to do
11 following that activity.
12 Q Okay. Thank you. So when you were
13 incorporating, or I think you used the term
14 "digitizing," the well files as part of
15 SoCalGas's Storage Integrity Management
16 Program, with that context in mind, relative
17 to other elements in SoCalGas's Storage
18 Integrity Management Program, how would you
19 rank the importance of well history -- or
20 well files? Excuse me.
21 MR. STODDARD: Objection. I'm not
22 following what you mean by ranking of
23 importance in context.
24 MR. GRUEN: Okay.
25 MS. CLORFEINE: And, Mr. Gruen, if I
26 can just ask for clarification. We're
27 talking about Storage Integrity Management
28 Program. We're talking about SIMP going

1 forward as opposed to a regular O and M? I
2 just want to be clear.
3 MR. GRUEN: It's a good clarification.
4 I was that close to actually saying my prior
5 question just calling -- using the term SIMP
6 as a shorthand, which I appreciate. That's a
7 good point. Maybe I should use that term.
8 With regards to the objection -- so
9 just to clarify with Ms. Razavi and Ms.
10 Kitson. If I use the term "Storage Integrity
11 Management Program" for the record, will you
12 understand -- if I use the term "SIMP," will
13 you understand that to refer to the Storage
14 Integrity Management Program?
15 WITNESS KITSON: A Yes.
16 WITNESS RAZAVI: A Yes.
17 MR. GRUEN: Q Okay. Okay. Thank you.
18 With regards to the objection, let
19 me see if I can unpack a little bit what the
20 terms are. What I'm asking about.
21 Are you familiar with other elements
22 in SIMP in addition to well files?
23 WITNESS RAZAVI: A I don't understand
24 your question.
25 Q What other things are there in
26 SIMP?
27 A What do you mean by "things"?
28 Q Criteria? How does the program

1 work? I can open the question up for both of
2 you.
3 WITNESS KITSON: A Do you mind if I
4 answer?
5 Q Please do.
6 A So when I talk about this program,
7 I'll talk a little bit about -- I know you're
8 looking prior to October, 2015. But I'll
9 talk about how we set it up, and this was our
10 vision prior to 2015. All these things may
11 not have been in place at this moment in
12 time.
13 Q Okay.
14 A So for a Storage Integrity
15 Management Program or an Integrity Management
16 Program in general, we look at it as a
17 continuous process; right?
18 So it starts with data gathering
19 for identification and that merges into the
20 field activities, which could be, you know,
21 well logging in this case for other integrity
22 programs that do pipeline inspection.
23 And then that information along
24 with the data you gathered up front goes into
25 the decision making for either reassessment
26 intervals, continued evaluation, preventative
27 and mitigative measures. And Avi's group's
28 role is the hub of that.

1 So as all the data continuously
2 flows in and out through all those processes,
3 and then the cycle continues. So it's never
4 ending.
5 Q Okay.
6 A Does that help?
7 Q I think so. I may have some
8 clarification. Let me digest that point for
9 a second.
10 The reassessment intervals and
11 preventative mitigation measures, you're
12 actually using the data that you gather
13 through the field activities in order to
14 reassess something. Am I tracking that
15 right?
16 A Let me clarify a little bit more.
17 So some of the mitigation activities, for
18 example, are things that we were doing as a
19 company long ago. Our daily well inspection,
20 taking pressure reads, and other things. And
21 so an Integrity Management Program
22 incorporates not only things that we were
23 doing in the past, but also new things that
24 are either required by regulation or that
25 we've identified as part of our inspection.
26 What I mean by "reassessment
27 intervals," is specifically to the logging or
28 the inspection of that activity. So for

1 example if we run a well log and do our
2 repairs, and we then go look at when is the
3 next time we need to inspect that well.
4 And in the meantime while you're
5 waiting to re-inspect that well, there are
6 things that you can do to monitor that well
7 and maintenance activities.
8 Q Okay. I think what I'm trying to
9 get at with the question -- and maybe, Ms.
10 Kitson, you might be the best person to
11 answer, and I'll check. Please feel free to
12 weigh in.
13 Can you do all the things that you
14 mentioned as a part of SIMP without well
15 files and the information contained within
16 them?
17 A No. Data's a key part to integrity
18 management. And the data continues to grow
19 and get better as the program matures. So
20 that's part of it, you know, is integrating
21 the data and identifying maybe additional
22 data fields that you might need moving
23 forward. You know, capturing it and putting
24 it into a center repository.
25 Q Thank you. Okay. That's helpful.
26 WITNESS RAZAVI: A May I add to that?
27 Q Yes, please.
28 A A couple of items that I'd like to

1 at least note that were done prior to
2 October 2015. We had a regular program to
3 run temperature surveys on our wells. We had
4 weekly pressure monitoring. I had a project
5 specific for Storage Integrity Management
6 Program called, "Well Siting Enhancement
7 Program" to install continuous pressure
8 monitoring to get our wells to be able to
9 monitor the pressures on tubing casing and
10 the annuli continuously.
11 Q And just to unpack that to be sure
12 I'm understanding. So the Well Site
13 Enhancement Project monitored pressures on
14 casing and annuli. Put crudely for me to
15 understand that you're talking about the
16 pipes that run into the well. The internal
17 pipe and then the pipe that's surrounding an
18 internal one. Would that be a fair
19 layperson's understanding of the terms casing
20 annuli?
21 A Correct. The pipeline's tubing and
22 the casing.
23 Q Okay.
24 A And the space between them.
25 Q Okay. Thank you.]
26 And --
27 MS. CLORFEINE: So -- wait, just --
28 sorry, Mr. Gruen. Can we just clarify, we're

1 talking about down-hole --
2 WITNESS RAZAVI: Yes.
3 MS. CLORFEINE: -- tubing and casing.
4 WITNESS RAZAVI: Yes, definitely.
5 MR. GRUEN: Fair point. Thank you.
6 Q So in terms of the well site
7 enhancement project to monitor pressures on
8 casing and anuli, were -- did you keep
9 records of the monitored pressures on those
10 pieces of pipe?
11 WITNESS RAZAVI: A Yes.
12 Q Okay. And were those included in
13 the well files?
14 A Yes. They are kept in different
15 repositories. Because those are digitized
16 information.
17 Q Okay. And I haven't asked you
18 about digitized; I appreciate that. We've
19 only asked about hard copy, so I will get
20 there -- go ahead.
21 A As a point of clarification --
22 Q Yes.
23 A -- the continuous pressure
24 monitoring and the well site enhancement
25 project was for all the fields --
26 (Reporter clarification.)
27 MS. CLORFEINE: Site enhancement.
28 WITNESS RAZAVI: Well site enhancement

1 project.
2 Prior to October 23rd, 2015, the
3 first field that had the continuous
4 monitoring was the La Goleta storage field.
5 MR. GRUEN: Okay.
6 Q Can you give an understanding -- so
7 I think I'm hearing that the well site
8 enhancement project was a data-gathering
9 effort to gather the monitored pressures on
10 the casing and anuli and digitize those data
11 points.
12 Am I getting that right?
13 A No.
14 Q Okay.
15 A The purpose of the well site
16 enhancement project to install pressure
17 transmitters --
18 Q Okay.
19 A -- on down-hole pipes at the
20 surface facility so you're able to monitor
21 the pressure on the pipes that are running
22 down hole.
23 Q Okay. Okay.
24 And what was the date in which the
25 pressure transmitters with your installed on
26 La Goleta? Do you know, approximately?
27 A The project was closed out in
28 November of 2015. It started in early 2015.

1 Q Okay. And La Goleta -- go ahead.
2 A Sometime around March of 2015 is
3 when we started the project.
4 Q Okay.
5 A And completed it by November.
6 Q Okay. Did you -- did SoCalGas
7 start to install pressure transmitters on
8 other fields during the time it was working
9 on La Goleta doing that? Or was La Goleta
10 the first.
11 A La Goleta was the first.
12 Q Okay.
13 A Field under that project.
14 Q Okay.
15 WITNESS KITSON: A Well, and we had a
16 plan to do all fields.
17 (Crosstalk of witnesses.)
18 WITNESS KITSON: A It was the first in
19 the project plan to do all fields.
20 WITNESS RAZAVI: A Yes.
21 MR. GRUEN: Okay.
22 Do you want to ask.
23 MR BRUNO: Yes. Thank you, Mr. Gruen.
24 EXAMINATION
25 BY MR. BRUNO:
26 Q Ms. Razavi, we have a question.
27 Earlier you talked about duplicate and
28 original, I guess, hard copy for well files

1 and, if I understood you correctly, you said
2 duplicates are not up-to-date; is that
3 correct?
4 WITNESS RAZAVI: A Yes.
5 Q What is the purpose of the
6 duplicate files for the other storage fields
7 at Aliso Canyon?
8 A I don't know, because I wasn't part
9 of the team. But when I joined the team,
10 there were duplicates of records at the Aliso
11 Canyon storage field.
12 Q Did you every look at the
13 duplicates at any of them?
14 A Not personally; I did not.
15 Q Do you know if they stopped at a
16 point in time? Or were they just not
17 generally kept up over time?
18 A I don't know.
19 Q Do you know if Aliso Canyon had
20 duplicates at other storage fields?
21 A I don't know.
22 Q Do you know if it’s part of a
23 redundancy or resiliency plan? In other
24 words, something happens at a storage field,
25 your records are at a back-up facility?
26 A I don't know.
27 Q Whose job is it to keep the well
28 files up-to-date? Like, was that a role?

1 Was that -- was that a responsibility you
2 had?
3 A No. But what time frame are we
4 speaking?
5 Q I'm referring to the time frame
6 since you were, you know -- any time frame
7 that you worked for SoCalGas and familiar,
8 you know, with the well files.
9 A Well, I joined that group in 2014.
10 It’s typically each group's, that managing
11 projects', to manage the records for that
12 project. That's their responsibility to do
13 that.
14 Q I'm sorry. Would you say that
15 again? Whose responsibility?
16 A The underground storage group that
17 had ongoing projects and doing the operations
18 and maintenance on those wells, it was their
19 responsibility to keep the records for those
20 wells up-to-date.
21 Q Okay. So is it -- am I
22 understanding correctly that it’s everybody's
23 responsibility in the underground storage
24 group to keep the well files up-to-date
25 whenever they do something to that well?
26 A The group, the organization, is
27 formed in a way that every person has a role
28 and responsibility to keep the well files

1 up-to-date based on the projects that they
2 manage or they touch on that well.
3 Q Okay. I understand that. Thank
4 you, Ms Razavi.
5 Is there anyone in charge of
6 quality assurance or quality control for the
7 contents of the well files?
8 A What time frame?
9 Q The same time frame that you were
10 just referring to. I think you said 2014.
11 A Well, I joined to team November
12 2014.
13 Q Yeah. So the time frame you can
14 speak to.
15 A Can you repeat your question,
16 please?
17 Q Yes, ma'am.
18 Is there anyone at SoCalGas in
19 charge of overall quality assurance or
20 quality control of the well files?
21 MR. STODDARD: Can we just clarify --
22 just because your question started off about
23 duplicate well files. And this instance --
24 MR. BRUNO: Excuse me, Mr. Stoddard.
25 She asked me a follow-up question, and I'm
26 clarifying what she asked me.
27 MR. SHER: This has nothing to do with
28 duplicates whatsoever. I'm not sure why

1 you've --
2 MR. STODDARD: That's all -- I'm just
3 asking, because the first questions were
4 about why duplicates may not have been
5 up-to-date. And now he's saying it's
6 somebody's responsibility about the well
7 files. And I just wanted to clarify this was
8 about to the non-duplicate well files.
9 MR. SHER: Yes. If that's needed, this
10 is about non-duplicate well files.
11 MR. BRUNO: Yeah. And I'll affirm
12 that. It’s not duplicate well files.
13 Q And just to -- hopefully, I
14 answered your question. But I'm specifically
15 referring to was anyone in charge of the
16 overall quality assurance/quality control of
17 the -- let’s call it the source well file?
18 A Again, it’s based on the
19 organization. Every individual who touches
20 that well and has some sort of project for
21 that well is in charge of that record.
22 EXAMINATION
23 BY MR. SHER:
24 Q So, to be clear, there was no
25 supervisor that checks an individual's work
26 as to the well file they are responsible for?
27 WITNESS RAZAVI: A Well, again, that's
28 an organizational structure. So if I'm the

1 manager for a group that is managing projects
2 that produces record for that well, as a
3 supervisor, I'm looking over that individual
4 who's managing those projects. And we have a
5 record -- an information management policy
6 which each -- as a company, which each
7 supervisor actually certifies that their
8 employees are -- understand that policy.
9 Q In the group -- we're talking 2014
10 through 2016; is that correct, the time
11 period?
12 A I guess I'll defer to Ken.
13 MR. BRUNO: Yes, my name is Ken Bruno.
14 I was actually asking you any time
15 you can speak to. I believe you started with
16 2014. So it’s really up to you to state. Is
17 that accurate? You're referring to the time
18 frame 2014.
19 WITNESS RAZAVI: A To 2016.
20 MR. BRUNO: Okay.
21 MR. SHER: Q So with regards to that
22 time period, how many individuals were in the
23 group? And who were they?
24 WITNESS RAZAVI: A Oh, I can't
25 remember. I need to look at the
26 organizational structure to remember.
27 Q Is it more than five people?
28 A Yes.

1 Q Is it more than ten people?
2 A Well, the -- there were people that
3 were added to the organization. And there
4 were people who left the organization. So
5 the number varies depending on exactly what
6 time frame we're speaking to. So even
7 between November 2014 to November 2016, I
8 can't think of individuals who were with the
9 group and who left the group.
10 Q So how many supervisors are in that
11 group?
12 A Within that time frame?
13 Q Please.
14 A There were two, I believe.
15 Q Do you recall their names?
16 A Sure. Todd Van Deputte and Tom
17 Schroeder.
18 Q So let’s, for example, focus on Mr.
19 Van Deputte. Would one of his roles have
20 been to do quality control and assurance as
21 Mr. Ken Bruno was asking?
22 A No. He was responsible for the
23 work that was done on those wells and.
24 Q And when you say "those wells," are
25 there a limited set of wells? Or are you
26 talking about all the wells at Aliso Canyon?
27 A No. The wells that they actually
28 worked over on, he would be responsible for

1 the work that was done on those particular
2 wells. And they could be for multiple
3 fields. It all depends on the time frame and
4 work that we had going on.
5 Q But with regards to -- I think you
6 said Mr. Schroeder or Mr. Van Deputte are the
7 supervisors who would have had quality
8 control roles; is that correct?
9 A They were supervisors of the
10 organization. So it was Tom Schroeder who
11 had the drilling department, which was Todd
12 Van Deputte. So Todd Van Deputte managed the
13 rig work activity, so activities that
14 required a rig and reports that were produced
15 as a result of the workover were under his
16 umbrella. I can't remember who was a
17 supervisor at the time that had the
18 operations piece that would manage the day to
19 day operations of the wells.
20 Q So --
21 A But there were two -- so if you
22 think of the organization, there was a
23 manager, there was a rig group drilling
24 manager who would manage workover activities,
25 and then we had storage field engineers group
26 that kind of managed the day-to-day
27 activities of that well; operations, what
28 well comes on, goes off, pressure monitoring,

1 running --
2 Q So with all that in mind, which
3 individuals would have, in a supervisory
4 level, reviewed the well files for quality
5 control?
6 A I don't know. I don't know what
7 the process for quality assurance would be.
8 But I know the managers of which I was
9 reporting up, also to a manager, would
10 certify that their employees understand the
11 information management policy of the company.
12 Q If a well file was incomplete,
13 would the supervisor discover that the well
14 file was missing data?
15 A I don't know.
16 Q Should, in your experience, a
17 supervisor discover whether well file data is
18 missing?
19 A I don't know.
20 Q Whose responsibility -- if data is
21 missing, with whom does that responsibility
22 lie?
23 A The group that is doing the work on
24 that well.
25 Q Okay. Thank you.
26 MR. STODDARD: We've been -- we've been
27 going almost for an hour. Can we take a
28 break?

1 MR. BRUNO: Let me -- I've got a couple
2 more questions just so we can wrap this up.
3 MR. GRUEN: Then we'll do a break.
4 EXAMINATION
5 BY MR. BRUNO:
6 Q Ms. Razavi, you mentioned policies.
7 Is there a document that specifies those
8 policies?
9 WITNESS RAZAVI: A Yes.
10 Q Do you recall the name of that
11 document?
12 A Sure. We have an information
13 management policy.
14 Q Is it specific to Aliso Canyon?
15 A No. It’s actually a company-wide
16 policy.
17 Q Oh, Okay. And that's a policy you
18 were familiar with between that 2014-2016
19 time period?
20 A Yes.
21 Q Okay. Does it have anything in the
22 way of quality assurance/quality control, to
23 your knowledge?
24 A I can't remember.
25 Q Okay. Do you know if there is a,
26 sort of, check-in/check-out? In other words,
27 if somebody wants to look at a well file at
28 Aliso Canyon, do they have to sign something?

1 Is there some sort of system that they do so?
2 A During that time, I'm aware of a
3 check-in/check-out mechanism.
4 Q And could you please describe that
5 mechanism?
6 A It’s a file that if one were to
7 remove a well file, they would have to sign
8 their name.
9 Q And how about when they return a
10 well file?
11 A And they would have to sign their
12 name returning the well file back.
13 Q Does it also capture what they did
14 with the file?
15 A I don't know.
16 Q Do you know if the well files are
17 every audited from another part of the
18 company; internal audit, if you will?
19 A I don't know.
20 Q Do the people -- do the underground
21 storage folks that do workover activities or
22 what have you, operations and maintenance,
23 they both put information in the well files,
24 but they also look at the well files to see
25 what's in there? Or is it more of a
26 repository where they put records in it?
27 A They would need to review the well
28 file in order to do their workover activities

1 and plan for the job.
2 Q Thank you, Ms. Razavi.
3 And then the group -- I believe
4 it's a -- I believe we were talking about a
5 SIMP group that looks at data.
6 Do they also annotate if they check
7 out a well file or not?
8 A I don't know. Because we are going
9 towards digitized data. So now we have a lot
10 of our records in a digital format.
11 Q And did the -- I'm not going to go
12 deep into digitized records now.
13 A Mm-hm.
14 Q But did the digitized process start
15 out with the well file?
16 A It's in the process of getting
17 digitized. It takes time to digitize all the
18 well files.
19 Q Is that a starting point though?
20 In other words, everything in a well file for
21 a given well is a starting point for the
22 digitization process?
23 A Yes, I just want to clarify
24 something. So my current team, we are
25 working on digitizing the well files, and
26 we're also putting -- enhancing our structure
27 to be able to centralize those digitized
28 records that the SIMP group is generating.

1 Q Okay. That sounds like a
2 worthwhile process.
3 Thank you, Ms. Razavi.
4 MR. GRUEN: Okay. And to honor my
5 promise, do we want to take a five-minute
6 break?
7 WITNESS KITSON: That would be great.
8 MR. GRUEN: Okay. Off the record
9 before.
10 (Off the record.)
11 MR. GRUEN: Back on the record.
12 Continuing on with questions about
13 the well files. So I think you were asked
14 beforehand about a check-in/check-out about
15 the well files. Just a few other questions
16 about the nature of the well files.
17 Q Do you know if there was an index
18 or table of contents or something that was
19 used in order to give an overview of the well
20 files that existed?
21 WITNESS RAZAVI: A Not that I'm aware
22 of.
23 Q Okay. Regarding the check out
24 forms then, when were those
25 check-in/check-out forms started?
26 A I don't know.
27 Q When were they completed?
28 A I don't know.

1 Q Okay. Are they ongoing today?
2 A I don't believe so, because they
3 are digitized. We're moving towards
4 digitizing our records, so we have different
5 repositories for digitized records. Those
6 check-in/check-outs are hard copy files that
7 were historically used --
8 Q Okay.
9 A -- before the time I joined the
10 group.
11 Q Okay. Are the well files in hard
12 copy still kept today?
13 A There are some hard copy records in
14 addition to the digitized copies. But we're
15 striving to go all digitized.
16 Q Are you keeping the hard copy
17 versions of all the well files as you strive
18 to go digitized?
19 A The hard copies that are produced
20 and we received from vendors, depending on
21 the type of record, are also kept in the well
22 file.
23 Q Okay. So all of the hard copies of
24 the well files are still kept.
25 Am I understanding that right.
26 A They are.
27 Q Okay. Let’s go back to the
28 November 2014, November 2016 time frame that

1 we talked about earlier.
2 Do you have that in mind?
3 A It was November 2014 when I joined
4 the group up until 2016 when I morphed into
5 my new position.
6 Q Approximately what time in 2016?
7 A May 2016.
8 Q Thank you. So with that timeline
9 in mind, November 2014 to approximately May
10 2016; do you have that timeline in mind?
11 A Sure.
12 Q Okay. Thank you.
13 What are the hard copy well files
14 used for?
15 A During that time frame?
16 Q Mm-hm. Yes.
17 A For planning workover activities,
18 to my knowledge.
19 Q What kind of activities?
20 A Workover activities, or drilling or
21 abandonment --
22 Q Operations and maintenance?
23 A Operations and maintenance.
24 Q Day-to-day --
25 A Just activities.
26 Q So day-to-day decisions regarding
27 the running of the wells; would that be a
28 fair characterization?

1 A You need to be more specific.
2 Because, I mean, there are many records
3 within the well file. And, specifically, I'm
4 assuming you're referring to hard copy well
5 files?
6 Q Correct.
7 A So, again, it all depends on the
8 type of activity that you're referring to.
9 Q Well --
10 A A day-to-day activity would be a
11 different repository for different -- again,
12 it all depends.
13 Q Well, let me ask you, what
14 specific -- I would like you to enumerate, if
15 you would please, what different activities
16 the well files are used for, including any
17 piece of information that is in the well
18 file.
19 A The hard copy files?
20 Q Correct.
21 A To my knowledge -- again, I joined
22 the team in November 2014, up until sometime
23 in 2016, used for planning workover
24 activities for each well.
25 Q And operations and maintenance as
26 well? Or no?
27 A Well, maintenance is part of your
28 workover activities and also --

1 Q Okay.
2 A -- is maintenance.
3 Q Okay. And you said drilling and
4 plugging in abandonment as well?
5 A Yes.
6 Q Okay. Regarding duplicate files --
7 so I'm using the term "duplicate well files"
8 and "well files" --
9 A Mm-hm.
10 Q -- to distinguish the well files
11 that have the check-in/check-out system for
12 those that are duplicates of those well
13 files.
14 Do the duplicates match the well
15 files?
16 A I don't know.
17 Q Who would?
18 A I -- that I also don't know.
19 Q How many duplicates are there for
20 each well file?
21 A I don't know.
22 Q Who would know the answer to that
23 question?
24 A Maybe Todd Van Deputte.
25 Q Okay.
26 Ms. Kitson, do you know the answer
27 to the questions that I asked about the
28 duplicates?

1 WITNESS KITSON: A I do not.
2 Q Okay. Are the duplicates used for
3 any -- to your knowledge, back to
4 November 2014 to May 2016, were the
5 duplicates well files used for any of the
6 activities that you had just described to me?
7 WITNESS RAZAVI: A I don't know.
8 Q Who would be using well files
9 during the time frame November 2014 to May
10 2016?
11 A For what purpose?
12 Q The activities that you described
13 to me.
14 A For workover drilling and
15 abandonment, the work -- the drilling group
16 and the storage field engineers.
17 Q Plugging and abandoning, that's
18 included in the workover drilling and
19 abandonment.
20 Is there anyone else that would be
21 using the well files? Any other people
22 within SoCalGas who would be using the well
23 files?
24 A I don't know. That's all I have --
25 I'm aware of.
26 Q Okay. Have you ever heard of an
27 instance where a workover group or the
28 storage field engineers used to duplicate?

1 A I don't know.
2 Q Okay. I think you were asked about
3 an information management policy. You
4 actually raised it to us, and you were asked
5 about the information management policy. And
6 I think you had indicated that you were not
7 aware whether there was quality
8 assurance/quality control called out in that
9 information management policy.
10 Did I follow you correctly?
11 A I don't remember. I need to review
12 the policy again.
13 Q Understood. How would we ask for
14 that policy? What is it called?
15 A Information Management Policy.
16 Q Okay. And that's the policy you
17 were talking about, the information
18 management policy that was in effect from
19 November 2014 to May 2016?
20 A I'm not sure when they updated, but
21 it was in place during that time.
22 Q And --
23 A As a company, we have that.
24 Q And --
25 A The entire company has that, yes.
26 Q And this is an information
27 management policy that gets updated
28 regularly?

1 A I don't know. But, typically, we
2 review our policies and update them on an
3 as-needed basis.
4 Q Are there multiple revisions to
5 this policy?
6 A I don't know.
7 Q Would you keep each of the
8 revisions to the policy?
9 A Out of my scope. I don't know.
10 Q Would SoCalGas keep each of the
11 revisions to the policy?
12 A I don't know.
13 Q Okay.
14 Ms. Kitson, do you know the answer
15 to that question? Would SoCalGas keep
16 revisions to the information management
17 policy?
18 WITNESS KITSON: A I'm not aware of
19 that policy.
20 Q Okay. All right.
21 And I think you had -- I had also
22 heard you say that there were managers who
23 made sure their employees were aware of the
24 information management policy.
25 Did I follow that part correctly,
26 as well?
27 A Yes.
28 Q So how would one know if the

1 information management policy was being
2 followed?
3 A Well -- I don't -- I can't speak to
4 that time frame, because I can't remember
5 what was in place exactly. But I know as
6 employees, we have trainings that we go
7 through. And we get trained on what an
8 information management policy is about once a
9 year. So we go through a refresher of that.
10 Q Okay. And so it’s up to employees
11 to follow -- to make sure that they
12 themselves are following the information
13 management policy; is that right?
14 A I don't understand your question.
15 Sorry.
16 Q Let me ask it to you directly.
17 It’s up to you as an employees to
18 make sure your following the information
19 management policy when you're doing your
20 work?
21 A Yes.
22 Q Does anyone check to make sure
23 you're following it properly?
24 A Not that I'm aware of. I don't
25 know.
26 Q To your knowledge, is there anyone
27 else, any of the other employees who the
28 information management policy applies to, is

1 their work being checked to make sure they
2 are following the information management
3 policy?
4 A I don't know.
5 Q Okay. Regarding the check-in and
6 check-out -- so I understood in your answers
7 to Mr. Bruno that there would be a log, if
8 you will, or a card, that would show when
9 someone checked one of the well files out of
10 the main repository and when they checked it
11 back in.
12 Am I following that right?
13 A I've seen a check card, yes.
14 Q Would the check card show if
15 anything was removed from a particular well
16 file once it was checked back in?
17 A I don't know.
18 Q Okay. In your review -- I assume
19 that you've done some review and looked at
20 the well files, hard copy of your well files,
21 during your digitization efforts.
22 Am I following that correctly?
23 A I, personally, have not. I have
24 contractors that they did.
25 Q And they worked for you?
26 A Yes.
27 Q Okay. And you oversaw their work?
28 A Correct.

1 Q Okay. Let me ask you to -- I think
2 you had mentioned that either there was no
3 duplicate set of well files for Aliso at
4 Aliso. And I don't remember that you said
5 you were not aware of that or that there was
6 none.
7 Could you clarify?
8 A I'm not aware of any. I don't know
9 if there is one or not.]
10 Q Are you aware of any duplicate well
11 files for Aliso at any of the other
12 facilities?
13 A I don't know.
14 Q Okay. So you're not aware if
15 there's a set of duplicates files for the
16 Aliso wells within SoCalGas or elsewhere? Am
17 I following that right?
18 A Correct. Of any. I don't know.
19 Q Okay. But you are aware of
20 duplicate well files for the other three
21 storage facilities; is that right?
22 A Yes.
23 Q And why is that that there --
24 you're familiar with -- I guess this is to
25 your knowledge, but do you have an
26 understanding of why? I don't want to say
27 that there aren't. You're just saying you're
28 not aware. But duplicate well files at Aliso

1 have never been brought to your attention?
2 A I haven't come across them. For
3 Aliso Canyon I have not.
4 Q Did you ever wonder why you hadn't
5 come across the duplicate well files for
6 Aliso?
7 A No. I don't know the history.
8 Q But you had had occasion to come
9 across the duplicate well files for the other
10 three storage fields?
11 A Yes.
12 Q Why did you have occasion to come
13 across the duplicate well files for the other
14 three storage fields?
15 A They're actually organized in file
16 cabinets. So they're labeled as "Playa del
17 Rey or Goleta," and they're organized in such
18 a manner. That's how I've come across them.
19 Q And they're next to one another?
20 A I don't know what you mean by "next
21 to one another."
22 Q When you talk about file cabinets
23 that show Goleta, Marina del Rey, Honor
24 Rancho, those file cabinets showing the
25 duplicate files -- well files, are those next
26 to each other?
27 A They're located within the same
28 vicinity, yes.

1 Q But not Aliso?
2 A The duplicate copies are you
3 referring to?
4 Q Correct.
5 A I don't know if Aliso has duplicate
6 well records --
7 Q Okay.
8 A -- in that same area. I'm not
9 aware of any.
10 Q You haven't seen them. Okay.
11 A I haven't.
12 Q Okay. All right. You heard anyone
13 talk about duplicate well files at Aliso?
14 A For Aliso Canyon?
15 Q For Aliso Canyon, yes.
16 A I have not.
17 Q All right.
18 WITNESS KITSON: A Could I maybe help
19 explain how the file cabinets -- so at Aliso
20 Canyon we have an area where we keep all well
21 files. So that's what she's referring to.
22 So there's the Aliso Canyon file cabinets;
23 then there's the Playa del Rey file cabinets,
24 and that's how they're organized.
25 Q Okay. Yeah. Okay. Let's switch
26 timelines. Thank you, Ms. Kitson.
27 Let's switch timelines to today.
28 The hard copies of the well files. Do you

1 know where they're kept today?
2 WITNESS RAZAVI: A They're at each
3 storage facility.
4 Q Okay. And the duplicates?
5 A The duplicates are not kept up to
6 date. So I'm not aware of any duplicates
7 being put back in to Aliso Canyon location
8 where the other duplicates were kept.
9 Q So where are the other duplicates
10 kept today?
11 A For other storage facilities? The
12 only duplicates that I'm aware of are located
13 at the Aliso Canyon facility.
14 Q In the same room that you saw them
15 --
16 A Yes.
17 Q -- back in 2014 to 2016?
18 A That's all I'm aware of.
19 Q Okay. All right. Are you aware of
20 any well files from -- back to 2014 to 2016
21 of November. 2014 to May 2016. Are you
22 aware of any well files that were missing?
23 A I'm not aware of any.
24 Q Okay. Was the well history well
25 file -- you're familiar with the well
26 entitled SS-25?
27 A Yes.
28 Q And you're aware that that was the

1 well that experienced an incident beginning
2 on October 23rd, 2015; correct?
3 A Yes.
4 Q Was the well file for SS-25
5 available as of October 23rd, 2015?
6 A Yes.
7 Q Was it in the repository that you
8 discussed?
9 A Yes.
10 Q To your knowledge, was the well
11 file for SS-25 missing any information
12 required by SoCalGas's internal policies,
13 practices, procedures, or other requirements
14 as of October 23rd, 2015?
15 A Not that I'm aware of.
16 Q Okay. When you say you don't know
17 if there were missing files from 2014 to
18 2016, if there were missing files, would
19 those have been documented?
20 A I don't know.
21 Q Who would?
22 A I don't know.
23 Q Ms. Kitson, do you know the answer
24 to that question?
25 WITNESS KITSON: A I don't know.
26 Q Okay. All right.
27 MR. SHER: Darryl, may I ask a
28 question?

1 MR. GRUEN: Yeah. Absolutely.
2 MR. SHER: Q Just following up.
3 How would one know if data was
4 missing from a well file?
5 A We're speaking hard copy records?
6 Q Prior to October 23rd, 2015.
7 A I don't know.
8 MR. GRUEN: Mr. Bruno, is there
9 anything you want to ask at this point?
10 MR. BRUNO: No. Thank you.
11 MR. GRUEN: I'm going to circulate a
12 document. Let's go off the record for just a
13 moment.
14 (Off the record.)
15 MR. GRUEN: Let's go back on the
16 record.
17 This is just to confirm that the
18 subpoena for the appearance today of Ms.
19 Kitson is marked as Exhibit 1.
20 (Exhibit No. 01 was marked for
identification.)
21
22 MR. GRUEN: And the subpoena for the
23 appearance of Mr. Razavi is marked as Exhibit
24 2.
25 (Exhibit No. 02 was marked for
identification.)
26
27 MR. GRUEN: Let's go off the record.
28 (Off the record.)

SED SUR_REPLY_001933

1 (Whereupon, the following material
was placed under seal by direction of
2 CPUC counsel:)
3
4 (Sealed material) (start seal.)
5 MR. GRUEN: Let's go back on the
6 record.
7 So let's mark as Exhibit 3 a
8 document that has the Bates Stamp -- and I'll
9 use the Bate Stamp convention that I believe
10 SoCalGas used to provide us this information.
11 There are two Bate Stamp
12 conventions, but I believe I'm using the
13 second one, which I believe is the one that
14 was intended for SED. So it's marked
15 AC_CPUC_SED_KITSON_0000709.
16 And to describe this document, it
17 has on the title page, "Southern California
18 Gas Company WellView Data Integrity Project.
19 Start Date: March 4, 2015."
20 And it looks like it's by Well
21 Lifecycle Resources.
22 (Exhibit No. 03 was marked for
identification.)
23
24 MS. CLORFEINE: If I can just say that
25 it has a start date label. And it ends in
26 the same convention 71100007.
27 MR. GRUEN: Thank you. That's helpful.
28 That's referring to the Bate Stamp convention

1 indeed. And those are the three pages of the
2 document. The Bate Stamp from 709 to 711 are
3 the last three numbers. Thank you, Ms.
4 Clorfeine.
5 MR. STODDARD: Can we also clarify for
6 the record because we'll be discussing this
7 on the record presumably that this is marked
8 as confidential and protected.
9 MR. GRUEN: Indeed. And to that end,
10 why don't we seal the record for this portion
11 of the transcript. Let's be under seal for
12 this.
13 Let's go off the record.
14 (Off the record.)
15 MR. GRUEN: Back on the record.
16 Q Ms. Razavi and Ms. Kitson, do you
17 see a copy of Exhibit 3 in front of you?
18 WITNESS KITSON: A Yes.
19 WITNESS RAZAVI: A Yes.
20 Q Do you have any corrections to the
21 way I described the cover page of that
22 document?
23 WITNESS KITSON: A No.
24 WITNESS RAZAVI: A No.
25 Q Okay. Thank you. Ms. Razavi, are
26 you familiar with the WellView Data Integrity
27 Project?
28 A Yes.

1 Q Okay. And can you describe at a
2 high level what it is, please?
3 A WellView is a well data management
4 system. And one of my first projects was to
5 digitize the records and use WellView for
6 that as a central repository for the
7 digitization of the data.
8 Q Okay. And it -- I see here it
9 began March 14th, 2015? Is that an accurate
10 start date?
11 A I can't remember exactly when it
12 starts, but the timeframe is about March.
13 Q Okay. Very good. What kinds of
14 data was digitized as part of the WellView
15 Data Integrity Project?
16 A Data that would draw the
17 schematics. That was our priority to make
18 sure we have Wellbore schematics.
19 Q Okay. Any data about other data,
20 non-schematic data about the history of
21 wells?
22 A That was the priority. So our
23 priority was to first make sure the Wellbore
24 schematic was being drawn properly in the
25 database.
26 Q And point noted about the priority.
27 I understand. Was -- I'll get it to later.
28 What was the WellView Data

1 Integrity Project used for?
2 A To digitize the well data into a
3 central repository and use WellView for that.
4 Q Was it used for integrity
5 management purposes?
6 A The goal was to have the data
7 digitized and be able to pull information in
8 and out of that database to enhance our,
9 again, data on -- use the data for integrity
10 management.
11 Q Okay. Thank you. Was it also used
12 for day-to-day operations and maintenance?
13 A No.
14 Q Okay. What other things was it
15 used for other than integrity management?
16 A Well, it was used for workover
17 drilling and abandonment operations.
18 Q Okay. All the way from the
19 drilling to the abandoning of -- if that was
20 the case for a particular well then? Am I
21 following that correctly?
22 A Timeframe matters. So if WellView
23 was the software that was implemented, then
24 it would have been used for those purposes.
25 Q Okay. Okay. Was it used to
26 document compliance with the requirements of
27 the Department of Oil and Gas Geothermal
28 Resources?

1 A For what timeframe?
2 Q Well, let's start with March 4th,
3 2015 to current date.
4 A And what requirements exactly?
5 Q Let me back up and just clarify
6 because your point about timeframe is good.
7 And let me -- I think it's appropriate to
8 nail down the dates, the timing of the
9 WellView Project. The WellView Integrity
10 Project.
11 So I understand it started in March
12 of 2015. When did it end?
13 A It's actually ongoing. We're
14 continuously digitizing and enhancing our
15 databases.
16 Q Understood. Okay. So with that
17 timeframe in mind from March of 2015 to
18 present day.
19 If I used the term "DOGGR" as an
20 acronym for Department of Oil Gas and
21 Geothermal Resources, will you understand
22 that acronym?
23 A Yes.
24 Q Excuse me. I stand corrected. The
25 Division of Oil Gas and Geothermal Resources
26 is represented by the acronym "DOGGR."
27 Will you understand if I use the
28 term?

A Yes.

Q Ms. Kitson, will you also understand if I use that term?

WITNESS KITSON: A Yes.

Q Okay. Thank you. So you asked about what sorts of DOGGR requirements. Let me ask, because you're the one with the knowledge on this point. So what sorts of DOGGR requirements was the WellView Data Integrity Project used to comply with?

A We used WellView to produce well histories and well size in compliance with DOGGR requirements for workover drilling and abandonment activities.

Q So DOGGR required that Southern California Gas Company provided it with -- I am sorry summaries and what?

A Well histories.

Q Well histories?

A Those forms have a specific number. I believe they're OG-100 and OG-103.

Q Thank you. And those are for DOGGR rules, DOGGR requirements? OG-100 and OG-103?

A Yes. They're DOGGR forms.

Q DOGGR forms. Okay. So those are summaries and history -- excuse me. Let me back up.

1 Those forms are used in order for
2 SoCalGas to fill out and thereby provide
3 DOGGR with summaries and well histories?
4 A Correct.
5 Q Okay. Thank you. Was the WellView
6 Data Integrity Project used to provide
7 communications with DOGGR about other well
8 data other than what you just described?
9 A As a point of clarification, this
10 project was done to digitize the records.
11 Q Okay.
12 A The communication would be done
13 through those who conducted those activities
14 and complied with those forms.
15 Q Understood.
16 A And provided those forms.
17 Q I follow. So then the forms, the
18 OG-100 and OG-103, would then be digitized
19 and entered into WellView?
20 A It would have been already in a
21 digitized format printed out of WellView
22 provided to the Division of Oil Gas
23 Geothermal Resources.
24 Q I see. So the digitization would
25 have automatically -- not would have. The
26 digitization of OG-100 and OG-103 was put
27 into WellView when those forms were created?
28 A Okay. Sorry. Let me clarify what

1 the project was. So WellView is a well data
2 management system.
3 Q Okay.
4 A It's a software and application
5 that has over 3,000 fields. This project was
6 to enter information, and it has visuals, to
7 be able to draw Wellbore schematics.
8 That was the first thing to put the
9 basic information about a well, about a
10 casing, a tubing, so it can draw those
11 properly. And it was also used, separate
12 from this project, by the drilling group that
13 conducted workover drilling and abandonment
14 operations to record the daily activities for
15 those drilling workover and abandonment in
16 WellView.
17 Subsequently, once the job was
18 completed, the OG-100 and 103 would be
19 produced out of the database for those
20 activities. So there are two separate
21 projects if you may.
22 Q I see. Okay. To be sure I'm
23 following, the information that had been
24 input in WellView, information about workover
25 drilling and abandonment operation was then
26 used once completed in order to create or
27 produce OG-100 and OG-103 for WellView?
28 A Correct. Not a part of this

1 project.
2 Q Yes.
3 A Yes.
4 Q So WellView -- was now that there's
5 information in WellView, the information can
6 then be used as separately. Separate from
7 the WellView Project in order to create
8 OG-100 and OG-103?
9 A Correct.
10 Q For purposes of reporting to DOGGR?
11 A Correct.
12 Q Understood. Thank you. That's
13 helpful. Okay. We've talked a little bit
14 about WellView. Why don't we get into the
15 document if we can. So if you'd turn to
16 page 2, which is Exhibit 3, which has the
17 Bate Stamp the last digits are 710. And I'll
18 read the project background on page 2. An
19 excerpt at right under the project background
20 heading. And so it says starting in the
21 second paragraph:
22 "In the past 40 to 75 years some
23 wells may have been modified and historical
24 well work records are in paper format. In
25 2001 the company initiated using WellView as
26 its main repository to capture and store well
27 history data and well schematics. To date
28 the company is primarily using paper well

1 files and DOGGR records to track well data.
2 The creation of a WellView database
3 containing the desired well data will reduce
4 the effort required to locate key well
5 information and therefore improve data
6 access, data quality, performance,
7 analyzation, well integrity monitoring, and
8 decision making.
9 At the start of the project, all
10 well schematic paper documents were scanned
11 into WellView as simple attachments.
12 However, approximately 95 percent of the
13 actual critical well data remains outside of
14 the WellView database. The majority of the
15 well files within the database are either
16 entirely or partially incomplete. Therefore,
17 the integrity of the well cannot be properly
18 monitored. Nor can the well data be analyzed
19 within the powerful WellView application.
20 Well Lifecycle Resources, LLC (WLR)
21 outlines the following phases as necessary to
22 correct the well data within the company's
23 WellView database bringing the data accuracy
24 to as near 100 percent as possible using the
25 available historical data."
26 Do you see that passage I just
27 read?
28 A Yes.

1 Q Okay. Thank you. The project
2 objective just below that -- do you see the
3 heading under that that says, "Project
4 objective"? And it says the project
5 objective, at least the first one is to audit
6 the existing state of the well data within
7 each well file as detailed below within the
8 WellView database. Do you see that?
9 A Yes.
10 Q Okay. Now some questions.
11 A Sure.
12 Q So as its main repository to
13 capture and store well history data and well
14 schematics in 2001, referring to the 2001
15 date, how had the data in WellView been used
16 from 2001 until the start of the WellView
17 Data Integrity Project in March 4, 2015?
18 A I don't know. Because I wasn't
19 with the group.
20 Q Okay. Okay. Do you know who would
21 know?
22 A Potentially Todd Van De Putte.
23 Q Ms. Kitson, can you shed any light
24 on the answer to that question?
25 WITNESS KITSON: A I would agree. It
26 would be Todd Van De Putte or Dan Neville
27 (phonetic). Someone who might have been in
28 the group prior.

1 Q Okay. Thank you. And I think
2 we're -- you were talking about digitization
3 and the process of capturing well data and
4 well schematics. Is this the process that
5 we're talking about? The WellView Data
6 Integrity Project?
7 WITNESS RAZAVI: A Yes.
8 Q Very good. Between 2001 and
9 March 4th, 2015, so prior to the inception of
10 this document here, was there an index or
11 something like it to find -- help figure out
12 where a record was in WellView?
13 A What records?
14 Q Any record in WellView? Go ahead.
15 A Let me just -- maybe I can shed
16 some light on how WellView is.
17 Q Please.
18 A Every well has a name, has an API
19 number. Within each well if there's
20 information in WellView, an attachment, it's
21 fairly simple to find that out. So it's a
22 database.
23 Q Okay. So let me just ask generally
24 then, how was WellView used from 2001 until
25 March 4th of 2015?
26 A I don't know.
27 Q Okay. I'm sorry the number that
28 you had just referenced, and I forget the

1 term that you used. It slipped my mind.
2 There was an authenticating number on a well
3 file? Am I following that correctly?
4 A Each well has an API number. Think
5 of it like a unique identifier for each well.
6 That is designated to each well by the
7 Division of Oil and Gas Geothermal Resources.
8 Q Okay. And so were the API numbers
9 used for reference within WellView as well
10 between 2001 and March 4th, 2015?
11 A I can't -- I don't know about 2001.
12 I know in 2015 we were able to locate wells
13 by API number in WellView.
14 Q Understood. Do you know how far
15 back -- how far back can you tell the API
16 numbers were used in WellView?
17 A I don't know.]
18 Q Okay. And could the API number be
19 used in order to access schematics in
20 WellView for the time you were aware in 2015?
21 A Yes.
22 Q Okay. If someone needed to access
23 to see well data, well -- the data showing --
24 the historic data on a well or a schematic
25 prior to October 23, 2015, where would they
26 go to find it?
27 Would they go to WellView? Would
28 they go to the paper files? Or would they go

1 somewhere else?
2 A Depends on what type of data.
3 Q Okay. Let’s go back to the
4 workover drilling and abandonment operation
5 data. Where would they go to find that data?
6 Would they go to WellView? Prior
7 to October 23rd, 2015, would they go to
8 WellView? Would they go to the hard copy
9 well file? Or somewhere else?
10 A Potentially, a combination of both.
11 Q Where would they go first?
12 A And from when to when are you
13 referring to?
14 Q Well, I want to -- I don't want to
15 go beyond your awareness here. So I'm
16 sticking with 2015, unless you're aware of
17 WellView -- the use of WellView prior to
18 2015. But if I'm understanding right, you
19 said we weren't?
20 A Correct.
21 Q Okay. So let’s just stay with
22 2015, prior to October 23rd, 2015, with.
23 That timeline in mind, if someone
24 wanted to access the workover drilling, and
25 abandonment data for a well file, would they
26 go to WellView or to the hard copy file or
27 somewhere else?
28 A A combination of both.

1 Q Okay.
2 A The hard copy file and WellView.
3 Q So they would go to both places?
4 A Correct.
5 Q To be sure? Okay.
6 What about for a schematic? The
7 same question. Beginning of 2015 to prior to
8 October 23, 2015, if someone wanted to access
9 and see a schematic for a given well, would
10 they go to WellView or a paper file or both?
11 A Both.
12 Q Okay. Would they go anywhere else
13 to access that data?
14 A Not that I'm aware of.
15 Q Okay. Same time period, let’s say
16 January 1st 2015 to October 22nd, 2015, and
17 let’s just keep those date in mind for these
18 questions unless I specify otherwise.
19 Do you understand that?
20 A Yes.
21 Q Okay. Did someone accessing data
22 in WellView have any means of confirming that
23 the information they found in WellView was
24 accurate?
25 A I don't understand your question.
26 Q How did someone know when they were
27 looking at data in WellView that they were
28 looking at accurate data?

1 A They would have to look at the hard
2 copy well files and make sure they are
3 familiar with the history of that well.
4 Q Is that why they looked at both
5 things? They looked at the hard copy to
6 confirm that the information they were
7 accessing if in WellView was accurate?
8 A I don't want to speculate, so...
9 Q Okay. So --
10 A I don't know.
11 Q You don't know?
12 A Correct.
13 Q Understood. Okay.
14 What about completeness of
15 information? How would someone looking in
16 WellView during this time know whether the
17 information they were accessing was complete?
18 A Looking at the hard copy well
19 files.
20 Q Okay. And if they looked at the
21 hard copy well file, after looking at that
22 and WellView, how would they then know the
23 information was complete?
24 A I don't know.
25 Q Okay. How would they know looking
26 at WellView and the well file, the hard copy,
27 were there discrepancies for given well files
28 between the two sources of information during

1 that time period?
2 A I don't know.
3 Q Okay. I'm going to glean from your
4 answers that if I ask -- let me just ask it.
5 If I ask questions about well file
6 data, including schematics, workover
7 drilling, to abandonment operation, prior to
8 2001, will you be able to answer questions
9 about that time period?
10 A No.
11 Q Okay. Understood. On page 2 of
12 the document -- and this is Bates -- This is
13 Exhibit 3. And the last three digits of the
14 Bates stamp are 710.
15 Just touching on this again, the
16 sentence that says under project objective,
17 "Audit the existing state of the well data
18 within each well file as detailed below
19 within the WellView database."
20 Do you see that?
21 A Yes.
22 Q And that audit that is being
23 referenced there included well data at Aliso
24 Canyon as shown on the next point under that
25 bullet; is that right?
26 A Yes.
27 Q Okay. Continuing down under
28 project objectives, the next full bullet was

1 to "Obtain and review all available
2 historical documentation and compare to the
3 data recorded in the WellView database."
4 Do you see that?
5 A Yes.
6 Q Okay. And then the historical
7 information included all the things listed
8 below there?
9 A (Long pause.)
10 Q Why don't we cover it. I note --
11 so, the historical information included
12 review of every daily report and additional
13 reports tallies, casing cement, tubing, et
14 cetera; is that right?
15 A Yes.
16 Q Including verifying every depth OD
17 and ID of well bores, casing cement, tubing
18 and well head?
19 A Yes.
20 Q And what do OD and ID stand for?
21 A Outside diameter and inside
22 diameter.
23 Q And included verifying definitive
24 surveys?
25 A (No response.)
26 Q I won't go through every one. But
27 I want to just get it on the record so
28 someone could see, basically, these different

1 things. I think I've got an idea.
2 So I want to ask about the fourth
3 point down, "Correcting data gaps in
4 WellView," under the second project
5 objective?
6 A Yes, I see that.
7 Q Okay. What sorts of the electronic
8 and paper files were audited in order to
9 correct data gaps?
10 A Well files.
11 Q Okay.
12 A So the purpose of the project was
13 to review the hard copy well files and
14 digitize those and put them into WellView.
15 Q Okay. And I think -- did
16 correcting data gaps in this case mean adding
17 to incomplete information? Or correcting
18 inaccurate information? Or something else?
19 A Adding into the well information
20 and also looking for correctiveness of the
21 information.
22 Q Okay. So it was both?
23 A Yes.
24 Q Both adding where there was missing
25 information and correcting inaccurate
26 information.
27 Am I getting that right?
28 A Based on the hard copy paper files

1 that had accurate information, yes.
2 Q Okay.
3 A If there was a typo of depth,
4 correct those.
5 Q For example?
6 A For example, yes.
7 Q Understood.
8 Were the project objectives
9 followed that are shown here?
10 A To an extent. We started, I
11 believe, with our La Goleta storage field.
12 Q Mm-hm.
13 A I can't remember, actually, so with
14 all of the fields we started. Yeah.
15 Q Okay. So they were followed for La
16 Goleta?
17 A Yes.
18 Q And I get that they are ongoing, so
19 maybe asking you "Were they followed" is not
20 the right way to ask the question really.
21 But, to date, to your knowledge,
22 have these project objectives been followed
23 in order to do the WellView data integrity
24 project?
25 A Yes.
26 Q Okay. Was there a document that
27 was used to review the audit results and the
28 corrected data?

1 A I believe we recorded that on
2 spreadsheets.
3 Q Okay. And what did you term that
4 spreadsheet?
5 A I can't remember.
6 Q Okay. Was there a forward action
7 plan to maintain data for long-term
8 stability? I'm sorry -- long-term
9 sustainability.
10 Let’s see if I can find that in
11 here.
12 WITNESS KITSON: It's the last bullet.
13 (Crosstalk.)
14 MR. GRUEN: Thank you.
15 So where it says, "Conclude a
16 forward action plan to maintain data for
17 long-term sustainability," there was a
18 forward action plan for long-term
19 sustainability?
20 A Well, if a project is still ongoing
21 and we're providing --
22 Q Point taken. Yes.
23 Is there an ongoing forward action
24 plan to maintain data for long-term
25 sustainability?
26 A Yes.
27 Q Okay. And, I guess, it’s called
28 the forward action plan? Is there another

1 term for it?
2 A No. It's a combination of
3 processes and governance that my team does,
4 provide training and ensuring that the data
5 is collected in the fields and are collected
6 and inputted in the proper formats in the
7 proper fields within the database to ensure
8 data integrity within our database.
9 Q Okay. All right.
10 Let's turn to page 3 of Exhibit 3,
11 if you would. And that has the last three
12 digits of the Bates stamp is 711. And
13 looking at the -- under process, where it
14 says, "The WLR team improves the well data
15 integrity in the following manner." I think
16 we read it earlier.
17 If you could, what is the WLR?
18 What does that stand for? Is that well life
19 cycle resources?
20 A Yes.
21 Q Okay. So it's the consultant that
22 was responsible for this work; is that right?
23 A Yes. They were hired under my
24 supervision to conduct these activities.
25 Q Thank you. Who was on the WLR
26 team?
27 A The contractors?
28 Q Yes.

A I can't remember their names.

Q Okay. If we -- I suppose we could data request that if we needed to, and we could find out.

Were there people from SoCalGas, as well, who worked with WLR? Obviously, you did. Were there others within SoCalGas who worked with WLR in order to do the WellView data integrity project?

A I don't believe they interact -- I mean, they -- their main responsibility was to look at the well history in the well file, scan them, review them, and input the data into WellView.

Q Okay.

A And that's as of March 4th, 2015.

Q Okay. So, two things about that, so did the -- it was just you and WLR who were working on the WellView data integrity project then?

A Correct.

Q Okay. And did the scope of the work change since March 4, 2015?

A Yes.

Q How so?

A We have -- we are capturing and digitizing more of the information. So, as I mentioned before, our focus was where

1 schematics only first. So we've expanded it
2 to capture more information in the WellView
3 database historical information.
4 Q Yes. Can you elaborate on what
5 kinds of information it has been expanded to
6 include to capture?
7 A For the time frame of? Which time
8 frame are we referring to?
9 Q Well, let’s back up.
10 So we're talking -- initially,
11 we're talking March 4th, 2015, or
12 thereabouts, when the project started. And
13 it’s still in effect today.
14 A Correct.
15 Q And I understand from you that the
16 scope has changed --
17 A Mm-hm.
18 Q Since March of 2015?
19 MS. CLORFEINE: Avi, wait for him to
20 finish the question before you answer.
21 Sorry --
22 MR. GRUEN: Sorry.
23 MS. CLORFEINE: No, sorry for
24 interrupting. I just wanted a clear record.
25 Because she's saying sorry every time you're
26 saying something. So I just want to be clear
27 when you're done asking your question.
28 MR. GRUEN: I appreciate it. Thank

1 you. And this one is a bit long, just to
2 capture and be sure I'm understanding what
3 you're saying, so...
4 MS. CLORFEINE: Sorry to interrupt.
5 MR. GRUEN: Not at all. I appreciate
6 it.
7 Q So in terms of timing, how did the
8 scope of the WellView data integrity project
9 change since March of 2015?
10 WITNESS RAZAVI: A It’S expanded.
11 Q And if you -- you mentioned that.
12 And I think you mentioned it’s been expanded
13 to capture various additional types of the
14 information, in addition to workover drilling
15 and abandonment operation and schematics.
16 Am I capturing that right?
17 A Yes. Can I add some clarification
18 to that?
19 Q Please do.
20 A So part of -- two things. This
21 vendor is not working on that project at the
22 moment, since my group has expanded. So we
23 are -- we have a dedicated group that
24 provides training to those who capture
25 information in WellView. While the workover,
26 abandonment, and drilling operations, the
27 actives were captured, now, what we've done,
28 we said -- I'll give you an example.

1 Instead of typing that we drilled
2 17-inch hole, now we're using that and
3 putting it into the fields that can be
4 queried out quicker. So if one wanted to
5 have the information in a tabular format
6 quickly, you could run a report out of
7 WellView. So in those senses, the scope has
8 expanded to train those who collect
9 information in the field, corrected in
10 formats that now could be queried out quicker
11 and be fed into our integrity management
12 program and the risk model.
13 Q I follow. I think I'm hearing it's
14 not the substance or kinds of information
15 that's been changed, but how it's tabulated
16 or compiled?
17 A Correct.
18 Q Did the scope of work in any way
19 expand or change for the WellView and data
20 integrity project as a result of what
21 happened on October 23, 2015?
22 A Um -- no, we continued the effort.
23 Q Okay. Okay.
24 So in terms of -- if you'll bear
25 with me a second?
26 A Do you mind if we take a quick
27 break?
28 MR. GRUEN: I do not. In fact, maybe

1 this is a good time for a lunch break? We're
2 at noon here. So do you -- we appreciate
3 that. Shall we go off the record?
4 MS. CLORFEINE: Yes, let's go off the
5 record.
6 MR. GRUEN: Off the record.
7 (Off the record.)
8 (Whereupon, at the hour of 12:11
p.m. a recess was taken until 1:25
9 p.m.)]
10 * * * * *
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1 AFTERNOON SESSION - 1:25 P.M.
2
3 * * * * *
4 AMY KITSON,
5 resumed the stand and testified further as
6 follows:
7 AVI RAZAVI,
8 resumed the stand and testified further as
9 follows:
10 MR. GRUEN: So let's go back on the
11 record if we can.
12 EXAMINATION RESUMED
13 BY MR. GRUEN:
14 And I think before we broke for lunch,
15 we were talking a little bit about paper
16 files, existing paper files, and also
17 WellView information -- information WellView.
18 And I think -- I don't know if I actually
19 used the term "well file" in the context of
20 WellView, but let me just ask you:
21 Q Are there well files in WellView
22 now?
23 WITNESS RAZAVI: A Well, "well file"
24 is a broad term; right?
25 Q Well --
26 A And what time frame, again? Sorry.
27 Just want to make sure we're --
28 Q That's okay. So starting with

1 March 4th, of 2015, or starting when the
2 WellView data integrity project began until
3 today.
4 Does WellView have well files?
5 A Yes. There are well information
6 records that are part of the well file.
7 Q Okay. And I know -- let me just
8 clarify. I'm working under the assumption
9 that your knowledge about WellView dates back
10 to the beginning of 2015.
11 Am I right in that assumption?
12 A Yes.
13 Q Okay. And so what about to the
14 beginning of 2015? WellView had well files
15 at that point as well?
16 A Yes.
17 Q Okay. All right.
18 So did you -- I think I was trying
19 to get at -- if you would, look on page 3 of
20 the Exhibit 3, page Bates 711 --
21 So you still have the document
22 entitled "WellView Data Integrity Project" in
23 front of you; right?
24 A Yes.
25 Q And you're on page 3?
26 A Yes.
27 Q And if you look under the heading
28 "process" at number five, it says there,

1 "Review and analyze every historical daily
2 drilling report and other relevant well
3 information gathered from existing paper well
4 files and DOGGR, and compare to the data that
5 is currently in the WellView database."
6 Do you see that?
7 A Yes.
8 Q Okay. So it’s comparing existing
9 well -- paper well files with data that's
10 currently in WellView; is that right? That's
11 what I'm understanding it to say in part.
12 A Yes.
13 Q And comparing DOGGR information to
14 the data that is currently in the WellView
15 database?
16 A That's what's written. I do went
17 to make a point of clarification.
18 Q Yes.
19 A That I believe this was a proposal
20 by the vendor and not a scope that I wrote.
21 Q Okay.
22 A I believe I wrote a request for
23 proposal at some point.
24 Q Okay.
25 A So --
26 Q And --
27 A But, anyways, we can move forward
28 with your question. I just wanted to say

1 that.
2 Q Well, yeah, I'm happy that you
3 mentioned that, because did the scope that
4 you wrote match this proposal?
5 A I don't remember. But I do
6 remember I specifically asked for the rates
7 to be included. And I don't see that in this
8 proposal. That's why I'm not sure if this
9 was a final version or -- it was within that
10 time frame of March 2015, I would say, but
11 I'm not sure if this is a final version,
12 so...
13 Q Do you want to take a look at it
14 and see if there's any information that isn't
15 included in the scope that you proposed for
16 the WellView data integrity project, please?
17 A I don't remember until I --
18 Q Okay. Do you want to take some
19 time off the record to see? Would it help
20 you to take a break and look at this and see
21 if there's anything that was not included in
22 the WellView data integrity project?
23 A Well, I do need to see the proposal
24 -- request for proposal that I wrote.
25 Q I see.
26 A To compare exactly word-by-word.
27 Q Okay. Maybe -- let's go off the
28 record for a second.

1 (Off the record.)
2 MR. GRUEN: Back on the record.
3 Q So while we are off the record, we
4 had asked -- I had understood from you, Ms.
5 Razavi, that you had prepared a Request For
6 Proposal that included the final scope of
7 work with regards to the WellView data
8 integrity project.
9 Did I understand that right?
10 WITNESS RAZAVI: A Yes.
11 Q Okay. Thank you.
12 And we will look to SoCalGas to
13 provide us with that document, please, and I
14 will ask for a data request and, also, to
15 identify, please, how the scope of work
16 changed in comparison to the Exhibit 3 that
17 we've been asking about today. So thank you
18 for the clarification.
19 As we move forward on this, if
20 there are any things that you recall today
21 that we ask about that are not part of the
22 final scope of work, could you please let us
23 know?
24 A Yes.
25 Q Do you know if there's anything
26 that we've asked about so far with regards to
27 Exhibit 3, this document, that were not
28 included in the final scope of work?

1 A As I stated, I don't remember until
2 I see the RFP.
3 Q Sure. I appreciate that. Okay.
4 Do you know if the final scope of
5 work in the Request For Proposal that you
6 prepared included the instruction to review
7 and analyze every historical daily drilling
8 report and other relevant well information
9 gathered from existing paper well files and
10 DOGGR and compare that to the data that is
11 currently in the WellView database?
12 A I believe that is part of the
13 scope.
14 Q Thank you. Okay.
15 So with regards to that, and that
16 instruction, if you will, why -- what was the
17 thinking behind comparing existing paper well
18 files with data that was in the WellView
19 database?
20 A In an effort to digitize the
21 records and centralize them in one location
22 -- so the purpose was to look at the well
23 files and the well histories and put them
24 into WellView.
25 Q Okay --
26 A Specifically, again, priority was
27 to be able to draw the well bore schematic.
28 Q Okay. Thank you. And as you

1 compared existing paper well files with the
2 WellView database data, did the files match?
3 A I don't remember. But the purpose
4 of it was then, again, we're enhancing the
5 database, we're populating the information
6 with it.
7 Q Okay.
8 A And we're, you know, populating the
9 data in it, so...
10 Q So one purpose -- so it was not
11 part of the purpose to check for accurate
12 population of the database based upon -- in
13 comparison to the well files, the paper well
14 files; is that right?]
15 A I don't understand your question.
16 Q When you populated the WellView
17 database, were -- was somebody looking to
18 accurately populate it with the existing
19 paper well file information?
20 A Point of clarification: The
21 contractors would read the well history, and
22 populate the information in WellView.
23 Q Thank you. And was there a quality
24 assurance/quality control process in doing
25 that population that you just described?
26 A For?
27 Q For populating a WellView database
28 using existing well files.

A Well, the well files would have been historical, and had already been sent to DOGGR; so it's historical information, the contractors reviewing the data, inputting it into WellView.

Q I understand.

A Yeah.

Q So -- so, as they're doing that --

A Yes.

Q -- as the -- as they're inputting the data from the historical well file into WellView --

A Uh-huh.

Q -- is someone checking their work to ensure that they've -- they've input the data into WellView accurately?

A Not at the time, we didn't have a process in place, because it was just me.

Q Okay. At the time that WellView data integrity project began, how many wells at Aliso Canyon were in WellView?

A I don't remember.

Q Do you have an approximate sense?

A I do not.

Q Okay. And so, I'm inferring, from your prior answer, you can't tell me how many wells at Aliso -- let me ask this differently.

1 Was any information WellView -- any
2 well file or well history information updated
3 using existing well files?
4 A I don't understand your question.
5 Q Okay. So what I'm getting at is
6 initially I had understood that the well
7 files were being used to populate --
8 A Uh-huh.
9 Q -- WellView, which suggests to me
10 that there was no existing well file
11 information in WellView. It was the first
12 time that information from that -- from a
13 given well file was input into WellView. Am
14 I following you correctly on that part?
15 A I don't know, because the database
16 was in place when I moved to that group.
17 Q Yeah. And I think this is what I'm
18 getting at, is since the database was in
19 place, were there -- here's what I'm
20 envisioning, and I'm looking to you to
21 correct me, is that there were some files
22 that had to be input completely, because they
23 did not exist in WellView, and other files
24 that maybe partially or completely did exist
25 in WellView, and so, the paper files were
26 used to update or somehow supplement that
27 information. Would that be an accurate
28 characterization?

1 A I'm not understanding what you're
2 saying. Sorry.
3 MR. SHER: Darryl, may I?
4 MR. GRUEN: Please.
5 EXAMINATION
6 BY MR. SHER:
7 Q Are you familiar with the
8 document -- sorry, with word processing
9 software called Word?
10 WITNESS RAZAVI: A Yes.
11 Q Are you familiar in Word that you
12 can track changes to a document that you're
13 working on?
14 A Yes.
15 Q Does WellView allow someone to go
16 into the WellView database and determine when
17 data was inputted?
18 A Yes.
19 EXAMINATION
20 BY MR. GRUEN:
21 Q And similarly, does WellView -- so
22 using that anology, the track changes
23 analogy --
24 A Uh-huh.
25 Q -- in Microsoft Word, what other
26 things can be tracked about changes made to
27 WellView?
28 A Date, time of when the data is

1 inputted.
2 Q Who -- who did the inputting?
3 A Yes.
4 Q Reason for the inputting?
5 A No.
6 Q Anything else?
7 A If I understand your question,
8 you're interested in understanding what it --
9 WellView can track in terms of changes made
10 to a data field?
11 Q Yeah, the nature of the changes
12 that were tracked to WellView.
13 A There's a timestamp in WellView, so
14 it does track who and what time and what
15 date --
16 Q Okay.
17 A -- the data was entered.
18 Q Okay. But, not the reasons for --
19 for the -- the changes that were tracked?
20 A Again, what type of changes are we
21 specifically --
22 Q Any changes that were made to
23 WellView.
24 A So, just so I have -- the design --
25 I -- I'd like to take some time and
26 explain --
27 Q Please.
28 A -- how the database works.

Q Please.

A So when there is a workover, drilling or abandonment operation, there's a field that is called the job, and it's -- you -- you cat -- the type of job is categorized in that field.

Q Okay.

A For example, casing repair.

Q Okay.

A So the reason for that data entry is going to be to do a repair --

Q Right.

A -- on the casing, and it's going to have daily operations associated with it and data associated with it.

Q Yeah.

A So it tracks the data on whomever is inputting the data into the database.

Q Okay. So using the casing example --

A Uh-huh.

Q -- in that case, you're talking about a change in conditions to the well. Right?

A Correct.

Q So you're documenting it as a change -- a re-casing project, essentially?

A It's a workover project.

1 Q A workover project.
2 A Uh-huh.
3 Q Are there instances where you were
4 tracking data not because of a change in
5 conditions in the field?
6 A I don't know.
7 MR. SHER: Let me ask.
8 MR. GRUEN: Go ahead.
9 EXAMINATION
10 BY MR. SHER:
11 Q So 2015 onwards, in your
12 experience, has -- have there been wells for
13 which there's been no data input into
14 WellView? I.e., there was just a hard copy,
15 and so, at some point, you were digitizing
16 hard copy records. Correct?
17 WITNESS RAZAVI: A Yes.
18 Q And so, were there any wells for
19 which there was no data in WellView, but you
20 were then going to input the hard copy data?
21 A Can you be more specific?
22 Q Are you aware of any well at Aliso
23 Canyon for which WellView had no data on that
24 well, but you had a hard copy file that you
25 were then going to digitize and put into
26 WellView?
27 A I don't know. I mean that's an
28 ongoing effort, that we're digitizing

1 records. It -- I don't --
2 Q Is it --
3 A I don't remember. I don't know.
4 Q Is it your understanding that all
5 of -- for Aliso Canyon, all of Aliso Canyon's
6 wells and their data, the well file, is all
7 in WellView?
8 A We are in the process of digitizing
9 the data from hard copy to electronic. And
10 to make a point of clarification, from 2015
11 and onwards, any activity done on any well,
12 the data is captured in WellView, and the
13 records are digitized and available in
14 repositories.
15 Q Do you know --
16 A The document --
17 Q I'm sorry. Do you know for how
18 long SoCalGas has used WellView?
19 A I don't.
20 Q Before you arrived, they were using
21 WellView?
22 A Yes.
23 Q And part of your remit 2015 onwards
24 was to update WellView with hard copy data?
25 A I was digitizing the data and
26 migrating the information from hard copy to
27 an electronic database, yes.
28 Q So you're using the word

1 digitizing, and I'm using the word updating
2 WellView. Are they the same thing, in your
3 mind?
4 A I don't know.
5 Q What is the difference, in your
6 mind?
7 A Between updating and digitizing?
8 Q (Nods.)
9 A Are you asking me to speculate?
10 Q Not at all. I'm just trying to
11 understand, because, in my mind, digitization
12 requires updating a digital record. Correct?
13 A Sure, unless a record doesn't
14 exist; then it needs to be created.
15 EXAMINATION
16 BY MR. GRUEN:
17 Q Is -- is there such a thing as
18 updating digital records once they are
19 entered into WellView?
20 WITNESS RAZAVI: A If there's work
21 conducted on a well, the data is constantly
22 being up -- updated, added, or data added to
23 WellView.
24 Q Same question: Is there such a
25 thing as updating information in WellView
26 without work being done on a well or without
27 a change in field conditions?
28 A What field, specifically, and

1 timeframe and --
2 Q I'm asking it generally on purpose.
3 A Uh-huh.
4 Q So I'm trying to get a sense if
5 there are reasons other than the change in
6 field conditions or workovers that would
7 prompt information in WellView to be updated.
8 Do you know the answer to that question?
9 A I don't.
10 Q Okay.
11 EXAMINATION
12 BY MR. SHER:
13 Q Do you know if -- in your
14 experience, throughout your entire career at
15 SoCalGas, have you come across any wells for
16 which there was no data in WellView?
17 WITNESS RAZAVI: A For which fields?
18 Q Aliso.
19 A I don't know.
20 Q Any of the other fields?
21 A Yes, Montebello.
22 Q And can you explain what you found?
23 A Oh, I didn't find anything.
24 Montebello wells are not in WellView.
25 Q Montebello is not in WellView?
26 A Correct.
27
28

1 EXAMINATION
2 BY MR. GRUEN:
3 Q Let me ask you to -- the -- the
4 reason -- back to track changes analogy from
5 Microsoft Word.
6 In terms of tracking the changes in
7 WellView, are there any tracked changes for
8 reasons of corrections to inaccurate data?
9 A As part of the digitization effort,
10 if, again, there was information in WellView
11 that there was a typo on a depth, that would
12 be corrected.
13 Q Any other types of corrections to
14 inaccurate data that would be shown in the
15 tracked changes?
16 A I don't know.
17 Q Okay. What about tracked changes
18 for reasons that data was incomplete in
19 WellView, and was being supplemented?
20 A The efforts that I was involved in,
21 and I'm still involved in, is to digitize the
22 hard copy records into WellView. So there
23 has been times that all the information isn't
24 in WellView because the well was drilled many
25 many years ago, potentially before the
26 company adopted WellView, that there are
27 going to be information that are in hard
28 copies that are not in WellView. We're in

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1 the process of digitizing them.
2 Q And in those instances in -- in
3 certain of those instances, was there part of
4 a file, a well file, already in "L" -- in
5 WellView?
6 A I don't know. I need -- I mean we
7 can look at a specific case.
8 Q Sure. I -- yeah. Well, I'm asking
9 generally. We can look at that later.
10 But, I think that what I'm trying
11 to get at here is whether there is
12 information that was -- that -- that
13 needed -- whether there are information gaps
14 in a well file that had to be filled in a
15 well file in WellView. Does that make sense?
16 MR. STODDARD: Regarding -- I think
17 she's been -- I mean I just want to make sure
18 that everybody's understanding, because I
19 feel like I'm hearing that --
20 MR. GRUEN: Yeah.
21 MR. STODDARD: -- that -- she's been
22 very clear that the purpose of this was to
23 migrate data from hard copy well files to
24 WellView; and so, by design, they were
25 bringing data that already existed out of the
26 well files that had already been recorded in
27 hard copy format, and putting them into
28 WellView. So the answer to your question

1 would be "Yes."
2 MR. GRUEN: I --
3 MR. STODDARD: I just don't know if --
4 MR. GRUEN: No, I don't -- I don't
5 think that's -- respectfully, I don't think
6 that's -- that's right. I get that much.
7 Q But, I'm asking something set --
8 differently from that, and that is whether
9 there was a well file that was incomplete in
10 WellView, and needed to have gaps filled in
11 in that well file to make it complete.
12 WITNESS RAZAVI: A So, well file,
13 throughout our conversation this morning and
14 this afternoon, we've referred to most of the
15 hard copy records. Right?
16 Q Sure.
17 A So our hard copy records are
18 complete, and they've been used as a means to
19 digitize the information in WellView.
20 Q Okay.
21 A As a company, we are digitizing all
22 of our records, and --
23 Q Okay.
24 A -- moving towards putting them into
25 a document management system.
26 Q Okay.
27 A So we are going to have all
28 digitized well files. So --

1 Q Okay.
2 A -- I'm not -- yeah.
3 EXAMINATION
4 BY MR. SHER:
5 Q Sorry. I heard you say, correct me
6 if I'm wrong, that the company had only
7 complete hard copy records for all of its
8 wells, meaning that there were no hard copy
9 well files missing data?
10 WITNESS RAZAVI: A That's my
11 understanding. From my perspective, when I
12 came on board, I was under the impression
13 that the hard copy files are complete and
14 accurate, and they are the main source of the
15 data.
16 MR. GRUEN: Okay.
17 WITNESS RAZAVI: A So we used those to
18 digitize and migrate into digital format.
19 MR. SHER: Q And there's been nothing,
20 in your experience, to indicate that a hard
21 copy well file was missing data?
22 WITNESS RAZAVI: A Not that I'm aware
23 of.
24 Q You've -- no one at Edison --
25 sorry. I always do that.
26 No one at SoCalGas alerted you or
27 someone you knew that there was data missing
28 from a hard copy well file?

A Not that I remember.

Q Okay.

EXAMINATION

BY MR. GRUEN:

Q Okay. So to -- to point five again on Exhibit-3, the portion of that statement that compares DOGGR data to the data that is currently in the WellView database, do you see that?

WITNESS RAZAVI: A Yes.

Q Okay. What types of DOGGR data were reviewed?

A I don't remember. We submit all of our data to DOGGR.

Q Okay. So -- so do you recall what types of DOGGR data were compared with data that was in the WellView database?

A I believe the well history and well summaries.

Q Okay.

A OG-100 and 103s, where it existed.

Q Okay. Why did you compare DOGGR data that -- the DOGGR data you just described with data that was in the WellView database?

A In an effort to digitize the data.

Q Right.

1 EXAMINATION
2 BY MR. SHER:
3 Q Sorry. The DOGGR data is in
4 SoCalGas' possession or in DOGGR's
5 possession?
6 WITNESS RAZAVI: A Well, we have --
7 it's in our well file, but also, we submit it
8 to DOGGR, and they have it on their well --
9 website for well research.
10 Point of clarification: The vendor
11 was working remotely, so one way for them to
12 access the data was -- since they didn't
13 necessarily have all the hard copies scanned,
14 was to access through the DOGGR database.
15 MR. GRUEN: Okay.
16 MR. SHER: Q Just to make sure I -- I
17 understand that, sorry, SoCalGas' third
18 party --
19 WITNESS RAZAVI: A Uh-huh.
20 Q -- working remotely didn't have
21 access to SoCalGas' hard copy well file?
22 A No. They didn't have access when
23 they were on site; however, they would come
24 on site, they would scan certain files, they
25 would go back to their location, and they
26 would also access the DOGGR website.
27 If they finished the work on what
28 they scanned, and what they couldn't make the

1 trip to come out, they would access the DOGGR
2 website, they would get what they could from
3 the website, during their next trip, they
4 would scan a different set of files, and they
5 would continue the digitizing.
6 Q Just to be very very clear --
7 A Sure.
8 Q -- you're not describing an
9 instance where the reason they went to the
10 DOGGR website or to DOGGR to get data was
11 because the hard copy well file was missing
12 data?
13 A Correct. No, that is not the case.
14 Q Is -- is there a reason why, as
15 opposed to going to the DOGGR website when
16 they were off site --
17 A Uh-huh.
18 Q -- that SoCalGas couldn't scan the
19 hard copy well file for them, and send it on
20 to them, or FAX it to the consultant?
21 A Yes, bandwidth.
22 Q Band --
23 A There was one person managing the
24 project and other projects, and that was me.
25 Q And so, did you give direction to
26 the consultants to go to the DOGGR website,
27 as opposed to coming to you, because of
28 bandwidth concerns?

1 A They would ask me, but I had
2 instructed them to definitely check the DOGGR
3 website, and then when they would come on
4 site, they could compare, and they would scan
5 what wasn't in DOGGR's website, and digitize
6 the information in WellView.
7 Q So part of their role would be,
8 when they came back to the Aliso Canyon, they
9 would compare what they got from DOGGR, what
10 was in the well file, and whatever they
11 didn't get from DOGGR, but was still in the
12 well file, they would then digitize that
13 remaining --
14 A Correct.
15 Q -- data? Thank you.
16 EXAMINATION
17 BY MR. GRUEN:
18 Q On -- on that point, let's say that
19 they -- the third party got information from
20 DOGGR and got information from the -- the
21 hard copy well file, used both in order to
22 compare with the WellView database, but the
23 DOGGR information and the well -- hard copy
24 well file information had discrepancies with
25 one another. Do you have that in mind?
26 A I'm not aware of any instances of
27 such.
28 Q You're not aware of any instances

1 of that?
2 A (Nods.)
3 Q Okay. To your knowledge, was there
4 quality assurance/quality control to check
5 for discrepancies between DOGGR and existing
6 well files, hard copies, that were used to
7 populate the WellView database?
8 A That was expected when they're
9 looking at the DOGGR website and then the
10 hard copy wells that -- hard copies on -- on
11 the site. I'm not aware of any instances
12 that that was identified.
13 Q And it -- and it was not documented
14 in instances -- if there were instances where
15 there were discrepancies between DOGGR and
16 existing well files, hard copy, were those --
17 were those documented anywhere, to your
18 knowledge?
19 A Not that I'm aware of.
20 Q Okay.
21 MR. BRUNO: If I may, real quick.
22 MR. GRUEN: Yeah, go ahead.
23 EXAMINATION
24 BY MR. BRUNO:
25 Q Ms. Razavi, do you -- I mean do you
26 contend that everything on the DOGGR website
27 is in the hard copy form, as well?
28 WITNESS RAZAVI: A That was my

1 impression when I joined the team and when I
2 started the project, that the hard copy files
3 have the full well history and data in them.
4 Q And how about the DOGGR data, is
5 the DOGGR data complete, based on your
6 experience?
7 A I don't know.
8 Q So if there was a discrepancy,
9 based on what you've described, it would be
10 that the well file is complete, and some of
11 that information in the well file's on the
12 DOGGR website?
13 A Yes, that's my understanding.
14 Q Would the step of the DOGGR website
15 have been completed if your vendor was on
16 site a hundred percent of the time at Aliso
17 Canyon?
18 A The well file was the main source
19 that they would go to, if they were on site.
20 Q If they were on site a hundred
21 percent of the time for the --
22 A Right.
23 Q -- duration of this project, would
24 they have had a need to go to the DOGGR
25 website?
26 A I don't believe so.
27 MR. BRUNO: Thank you.
28

1 EXAMINATION
2 BY MR. GRUEN:
3 Q Okay. I want to ask you
4 specifically about Well SS-25, both "A" and
5 "B," as part of the WellView data integrity
6 project, so dating March of 2015 to prior to
7 October 23rd, 2015.
8 Did you -- did you update the Aliso
9 Well SS-25 as part of the WellView data
10 integrity project at that time?
11 A What was the time, again? Sorry.
12 Q That's okay. March of 2015 to
13 October 22nd, 2015.
14 A I don't remember.
15 Q Okay. Did you update Well SS-25-A
16 or "B" at any point as part of the WellView
17 data integrity project?
18 A I don't remember.
19 Q Okay. Let's go to point 8 of
20 page 3 of Exhibit-3, where it says,
21 "Schematic generation." Do you see that?
22 A Yes.
23 Q What is a schematic?
24 A A diagram.
25 Q Of a well?
26 A If it's a wellbore schematic, then,
27 yes, it's a down-hole wellbore diagram.
28 Q Okay. And what things are the down

1 wellbore diagrams -- those schematics used
2 for?
3 A I don't know. Someone from
4 operations should probably answer that
5 question.
6 Q At a high level, are they used for
7 integrity management?
8 A I don't know.
9 Q Okay. Ms. Kitson, do you know the
10 answer to that question? Are -- are down
11 wellbore schematics at Southern California
12 Gas Company used for integrity management
13 purposes?
14 WITNESS KITSON: A You're talking
15 about integrity management, the well
16 inspection, so our SIMP team doing the well
17 logging would use the schematic as part of
18 their job.
19 Q As part of their job to do
20 integrity management?
21 A Uh-huh.
22 Q Okay. Just for the record --
23 A Yes.
24 Q -- I think you said, "Yes."
25 A Sorry.
26 Q Okay. Thank you. Would -- are the
27 schematics used -- do you know if the
28 schematics are used to provide information to

1 the California Public Utilities Commission?
2 A I don't know.
3 Q Do you know if the schematics are
4 used to provide information to DOGGR?
5 A The team that does the well logging
6 and inspections, they put together a work
7 plan prior to performing the work, and the
8 schematic and the work plan is sent to DOGGR
9 for permitting process.
10 Q Okay. And so, the schematics in
11 WellView of those wells would be those that
12 were permitted by DOGGR, do you know?
13 A Yeah, I'd have to -- I know we have
14 different --
15 WITNESS RAZAVI: A So I'd like to take
16 a moment, and give a quick background --
17 Q Please.
18 A -- on the schematics.
19 Q That's helpful. Thank you.
20 A While this effort was focused on
21 making sure the data that draws the wellbore
22 schematic is inputted into WellView, the
23 visualization aspect of WellView was
24 challenging, so we used a third party to
25 develop the wellbore diagrams and provided
26 those to DOGGR.
27 Q The third party who developed the
28 wellbore diagrams -- if -- just as -- just

1 for shorthand, if I use the term schematic,
2 you'll understand that to mean wellbore
3 diagram in this case?
4 A Sure.
5 Q Okay. Thank you. So the third
6 party that provided the schematic to DOGGR,
7 was that part of the WellView data integrity
8 project?]
9 A What timeframe are we?
10 Q March of 2015 to let's say just
11 prior to Aliso. The incident at Aliso. So
12 prior to October 23rd, 2015?
13 A During that time, the 3rd party
14 Wellbore diagrams were not produced for
15 DOGGR.
16 Q What timeframe were they produced
17 for DOGGR?
18 A I don't know the exact time but
19 2016, 2017 as a general.
20 Q Okay. Why were they produced for
21 DOGGR?
22 A For the activities that Amy just
23 described for the Storage Integrity
24 Management Program. They would plan their
25 work, and they would have to have a proposed
26 diagram and that was for permitting.
27 Q Okay.
28 MR. BRUNO: Excuse me.

1 MR. GRUEN: Please.
2 EXAMINATION
3 BY MR. BRUNO:
4 Q Are you saying that DOGGR did work
5 on the Storage Integrity Management Program?
6 A No. I'm saying that the workover
7 program had to be permitted by DOGGR. So the
8 group, the SIMP Group, would write the
9 program. They would have to have a proposed
10 diagram available and attached to the plan.
11 And submit it to DOGGR for permitting and
12 then they would approve or reject or permit.
13 Q So it was SoCalGas's work
14 requesting the permit?
15 A Correct.
16 Q It had nothing to do with the
17 comprehensive safety review by DOGGR.
18 WITNESS KITSON: A I'll answer that.
19 So in this case, I think we're talking about
20 the same thing. So a comprehensive safety
21 review by DOGGR included many of the well
22 logging activities that we're referring to
23 here.
24 So, for example, in the
25 comprehensive safety review, order 1109,
26 there are a multitude of well logs that were
27 required. And so the engineers would write
28 up a program detailing the steps that they

1 would take to run those logs and attach the
2 Wellbore diagram to it so DOGGR could see how
3 the program versus what the well looks like.
4 Q That's helpful. Thank you.
5 EXAMINATION
6 BY MR. GRUEN:
7 Q So I think I'm struggling with just
8 one order of events here. The third party
9 provided these schematics to DOGGR in some
10 point around 2016, 2017 somewhere thereabouts
11 these included wells that had long since been
12 permitted; right? They were schematics for
13 wells that had since been -- that had been
14 already permitted by DOGGR?
15 WITNESS KITSON: A The permit we're
16 referring to here is the permit to do the
17 workover. So we cannot, as a company,
18 perform that work without getting a permit
19 from DOGGR. We can't put a rig on that well
20 and run logs without a permit from DOGGR.
21 Q I'm following. Go ahead, please.
22 Did you want to say more?
23 A No.
24 Q I think I am following. What I'm
25 trying to get at is: Was each schematic
26 provided to DOGGR? A schematic that included
27 a workover permit or a drilling permit?
28 A The workover or drilling permit was

1 a result of submitting the diagram to DOGGR.
2 So maybe the third party vendor -- it wasn't
3 -- they provided it to the company, SoCalGas.
4 Not directly to DOGGR. So we solicited the
5 work. They developed a diagram for the
6 engineer. The work plan and the permit -- or
7 the schematic were submitted to DOGGR for a
8 permit to do the work to put the rig on the
9 well.
10 Q Which would be the typical
11 permitting process; correct?
12 A Correct.
13 Q So where I'm -- that permitting
14 process has been going on for years with
15 DOGGR and SoCalGas.
16 But the wells that were -- the
17 schematics that were provided to DOGGR in
18 2016 and 2017, were those schematics -- did
19 all those schematics require some sort of
20 workover or drilling permit?
21 WITNESS RAZAVI: A I don't understand
22 your question.
23 Q Maybe it's just best to ask why
24 were the third parties -- the schematics of
25 the third party that worked on, why were
26 those provided to DOGGR?
27 A We're required to provide a diagram
28 to DOGGR as part of our planning.

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1 Q Okay.
2 A A proposed pre-work so they can see
3 the existing condition of the Wellbore along
4 with the program and understand how the
5 program is going to reflect the Wellbore.
6 Q Okay. So we're still on the
7 permitting process.
8 A Correct.
9 Q I'm following the permitting
10 process. I'm with you both, and I get that.
11 I appreciate the description. I think what
12 I'm trying to get at is if there were any
13 others, and I'm not -- I'm hearing that there
14 weren't. I think I'm hearing that there
15 weren't any additional schematics provided to
16 DOGGR for reasons other than a permitting
17 process. Am I following that correctly?
18 A I don't know. But what I do know
19 is that we did provide diagram post workover
20 activities to DOGGR.
21 Q Okay. Okay. Which would be -- and
22 the diagrams that provided post workover
23 activities, were those different than the
24 diagrams that were provided to DOGGR for
25 permit in certain cases?
26 A So there are the as built; right?
27 So if there was a change in the process of
28 the workover, they would kind of reflect on

1 the final diagram. So the work would be
2 conducted, and we would give them the final
3 as-built diagram.
4 Q Sure. So the as-built is provided
5 to DOGGR as a matter of course. Whether the
6 project -- whether the workover changed after
7 the permit or not. The as-built was provided
8 to DOGGR as a matter of process?
9 A The final.
10 Q The final diagram?
11 A Yes.
12 Q Okay. Okay. Let me circulate --
13 MR. GRUEN: Let's go off the record for
14 a second.
15 (Off the record.)
16 MR. GRUEN: Let's go back on the
17 record.
18 Q Just with regards, Ms. Razavi, with
19 regards to the WellView Data Integrity
20 Project, when will it be done?
21 A When?
22 Q When will it be finished?
23 A Our timeline is through next year.
24 But it's kind of -- I mean, we're continually
25 updating our process and making it more
26 efficient.
27 I just want to clarify two things
28 because I think maybe this will help put it

1 in context. WellView is a Well Data
2 Management System. So we're taking the
3 well-related information and digitizing it
4 and putting it into WellView.
5 We're also digitizing the record
6 itself and moving it into a document
7 management system. That's another effort
8 that is underway and putting it in so we'll
9 have an electronic record available in one
10 repository so it will be a single repository
11 that it could access the record, and it would
12 have our data access through WellView so.
13 Q Which source, the WellView or the
14 Document Management System will be used for
15 workover, drilling, and abandonment.
16 A So the data would be entered into
17 WellView, and the record would be generated.
18 And that record would reside in the Document
19 Management System.
20 Q And which of -- so the record
21 residing in the Document Management System
22 would be used for workover drilling and
23 abandonment to inform day-to-day decisions
24 for workover drilling and abandonment. What
25 is the source of information?
26 A You need to be more specific.
27 Day-to-day activities of what?
28 Q Okay. Let's take the example you

1 gave before where you had a workover on -- I
2 think the term you used -- I think you were
3 talking about annulus. If you were talking
4 about a casing project, what source of
5 information would you use to inform? To get
6 data to inform the casing?
7 A Okay. Maybe it would be helpful if
8 I just take a moment to explain the different
9 types of information and the different
10 repositories and put it in context.
11 Q Please.
12 A Pressure information has its own
13 repository.
14 Q What's that called?
15 A It's called OSIsoft PI (phonetic.)
16 It's a process information management system.
17 Certain records for wellhead maintenance
18 that's in our repository called Maximo. It's
19 a maintenance management system. Well data,
20 is in WellView. Records, are hard copy and
21 on servers.
22 So we're digitizing the data from
23 hard copy files. Putting the data into
24 WellView, and we are consolidating the hard
25 copies and scanning them and putting them
26 into a document management system. I hope
27 that, kind of, paints the picture.
28 MR. BRUNO: I think it's helpful. I

1 have a couple questions.
2 EXAMINATION
3 BY MR. BRUNO:
4 Q The hard copy digitization work
5 that goes into WellView, isn't that static?
6 In other words, the file is the file. And at
7 some point, 100 percent of that will go into
8 WellView and it will be done? Or are you
9 putting new stuff in the file and then
10 pulling it out of the file and then
11 digitizing it?
12 A So you're right. The file is a
13 file. We're not putting 100 percent of that
14 file into WellView. We're putting -- we're
15 getting the well-related information out of
16 it.
17 So in essence -- let me explain
18 this better. If there is daily operations
19 written from the '40s and the '50s, we're not
20 going and typing all that information back
21 into WellView. Rather, we're reading that
22 well history and we're getting the certain
23 information out of that and putting it into
24 WellView so we can query the data quicker so
25 casing ID, Wellbore size, information as
26 such.
27 Q Sure. And when will that be
28 complete for all the wells at Aliso Canyon?

A Our timeline is through next year.
Q Through 2019?
A Yes.
Q And then just to make sure that I heard you correctly. Some data will remain -- well, all data will remain in the hard copy file. And then they'll be unique data in there like logs from the '50s or '60s or some time period. That's never going into WellView?
A Yes. The daily reports they will not be repopulated in WellView.
Q Are some -- there's over 100 wells at Aliso Canyon; is that correct?
A Depends. Gas storage wells?
Q Gas storage wells. Approximately, over 100?
A I don't remember the number. It all changes.
Q Are they all incomplete at this point in terms of that 2019 deadline or 2019 goal? Or are some done and some aren't? Like the current state of affairs of digitizing the information?
A I believe there's some done.
Q Okay. And then just to make sure -- I do appreciate that background you gave on the different parts of Maximo or WellView.

1 Workover activities that happen
2 today, they will go directly into the system?
3 A Correct.
4 Q They don't go into the hard copy
5 file?
6 A The data and the data activities,
7 they're all in WellView. The records that
8 are generated, they are on our servers and
9 some are attached in WellView.
10 There are also hard copies, but
11 they're all digitized, so we have these
12 electronically.
13 EXAMINATION
14 BY MR. GRUEN:
15 Q Will the updates --
16 A Can I clarify that?
17 MS. CLORFEINE: I think so. Because it
18 can't be hard copy and digitized.
19 MR. GRUEN: Q Can it be hard copy and
20 digitized? Can you have both?
21 A Yes. For example, the inspection
22 logs. The vendors provide us with a hard
23 copy and a digitized format so we have both.
24 Q And if you do a workover, I get
25 that you're updating the data in WellView.
26 Are you doing anything to the hard copies in
27 the Data Management System that you're
28 creating for them?

A We have project plans in to also consolidate all the hard copy records.

Q So not just consolidate but update them as you do workovers for example. Will you update the hard copy -- the hard copy files in the Data Management System as you continue to do workovers even after you complete WellView?

A So records is a different -- I'd like to draw a line between the records and the WellView project. WellView is for the data. Records are the Document Management System.

We do have plans to go fully digitized. However, we do understand there are going to be hard copy records that are provided through the vendors to us. So we're currently planning for consolidation of those hard copy records and updating the well files.

Q When you say "consolidation," I don't think we're using the same terms. I want to be sure. Will the data in WellView continue to match the information on the records in the Data Management System?

A Yes.

1 EXAMINATION
2 BY MR. BRUNO:
3 Q Okay. Where are the hard copies
4 going to go?
5 A In the well files. In the hard
6 copy well file.
7 Q Okay. If a well is plugged and
8 abandoned, do you still maintain the hard
9 copy of the well file?
10 A Yes.
11 Q How about in the electronic system?
12 Is that still maintained?
13 A Yes.
14 Q Indefinitely?
15 A Our retention policy is for the
16 life of the facility plus five years. And
17 that's the life of the storage facility plus
18 five.
19 Q So the Aliso Canyon Storage
20 Facility?
21 A Correct.
22 MR. GRUEN: Let me circulate if I can.
23 Off the record, please.
24 (Off the record.)
25 MR. GRUEN: Okay. Let's go back on the
26 record.
27 Wile we're off the record, I
28 circulated a document. Ms. Razavi, if I

1 could just confirm your recognition of this.
2 So this is marked
3 AC_CPUC_SED_KITSON_0000708. It has an
4 attached document that's stapled to it, which
5 unfortunately the Bates numbers didn't print
6 on this one. But we will -- just for
7 purposes of identifying the document this is
8 an e-mail that appears to be from Avi. There
9 is Avi. It's dated January 15th, 2016,
10 7:17 a.m. The subject is SIMP-WellView data
11 cleanup update. The attachments WLR-SoCal
12 WellView Database Integrity
13 Project-01.14.2016.PDF; Completed Well 2015
14 XLSX.
15 Q First of all, Ms. Kitson -- excuse
16 me. Ms. Razavi. Excuse me.
17 WITNESS KITSON: A That's all right.
18 Q As you see it, did I describe all
19 those things correctly?
20 WITNESS RAZAVI: A Yes.
21 Q And is this indeed an e-mail from
22 you dated January 15th, 2016?
23 A Yes.
24 Q You wrote this then?
25 A Yes.
26 Q Is the document -- do you recognize
27 the document attached to this hard copy
28 that's stapled as the attachment that is

1 labeled here the WLR SoCal WellView Database
2 Integrity Project?
3 A Yes.
4 Q So you are familiar with the list
5 of wells identified in the attachment then?
6 A Yes.
7 Q Okay. Turning to the e-mail itself
8 on January 15th, 2016, that you wrote, the
9 second paragraph says,
10 "Attached please see the list of
11 wells that we successfully cleaned up in
12 2015. I've also attached a summary of the
13 scope of the work cleanup criteria along with
14 process used to perform the cleanup."
15 Do you see that?
16 A Yes.
17 Q So then the list that you
18 identified in this attachment to the hard
19 copy is the list of wells that were
20 successfully cleaned up in 2015?]
21 A Yes.
22 Q And if we look at -- if you turn to
23 the document, the attachment, do you see the
24 title -- the name -- the column headings at
25 the top in blue, "Field name, well names, and
26 week completed"?
27 A Yes.
28 MS. CLORFEINE: Just for the record,

1 this is a black-and-white copy.
2 MR. GRUEN: Okay.
3 WITNESS KITSON: We have color.
4 MS. CLORFEINE: I apologize. I took my
5 glasses off.
6 (Crosstalk.)
7 MR. GRUEN: Some of them may be black
8 and white. But, fortunately, Ms. Razavi has
9 a color copy; right?
10 WITNESS RAZAVI: Yes.
11 MR. GRUEN: We're not trying to confuse
12 you with the colors, just trying to get the
13 facts down. And I'll do my best to refer to
14 the top without using colors for Counsel's
15 benefit. We did have to make some last
16 minute-copies.
17 MS. CLORFEINE: No problem. Thank you.
18 MR. GRUEN: Q So at the top then, the
19 top of the attachment, there are the words
20 "Field name, well names, and week completed."
21 Do you see those headings.
22 A Yes.
23 Q Okay. So the field name would be
24 the field where the well had its history file
25 cleaned up; is that accurate?
26 A Yes.
27 Q And the well name would represent
28 which well had its well history file cleaned

1 up; is that also accurate?
2 A Yes.
3 Q And the week completed would
4 represent the week including the dates,
5 month, and year in which the well file for
6 each well itemized on this list was cleaned
7 up?
8 A The well files were digitized into
9 WellView, yes.
10 Q Okay.
11 A During that week.
12 Q When they were digitized into
13 WellView?
14 A Yes.
15 Q Okay. So is digitizing into
16 WellView the same thing as cleaning up?
17 A In this context, that's what I
18 meant in this email, yes.
19 Q Okay. Okay. And does cleaning up
20 mean anything in addition to digitizing into
21 WellView in this context? Did you mean it to
22 -- did you intend it to mean anything else?
23 A No. I mean, digitizing well files
24 is to WellView.
25 Q Okay. All right. Continuing to
26 the back of the attachment then, do you see
27 where it lists Aliso Canyon?
28 A Yes.

1 Q Let me back up. Yeah. Just -- if
2 I can -- if you go to the email, back to the
3 email January 15th, where it says,
4 "The purpose of this project is to
5 enter missing and/or correct, pertinent well
6 data in WellView."
7 Do you see that?
8 A That's what paragraph?
9 Q The first paragraph, last sentence.
10 A Yes, I see that.
11 Q Okay. So, then, what did you mean
12 when you wrote that sentence?
13 A Well, at the time -- again, the
14 purpose of the project was to digitize the
15 records. So if there were no information in
16 WellView, we were populating that -- or the
17 contractor was populating that in WellView.
18 And if there were errors such as typos or
19 incorrect depths, we would look at the well
20 file and make those corrections into
21 WellView.
22 Q Okay. And you mentioned typos,
23 were you made aware of any other errors in
24 WellView that were corrected?
25 A I don't remember.
26 Q Okay. All right.
27
28

1 EXAMINATION
2 BY MR. SHER:
3 Q Is it clear though that if one were
4 to look at the WellView file or database, one
5 would see what was put in on a daily basis if
6 any changes were made to that particular
7 database?
8 WITNESS RAZAVI: A I need to look at
9 WellView. I do want to make a point of
10 clarification here. So this effort was done
11 by the vendor -- Well Lifecycle Resources.
12 Post this effort, we did a -- well, we're
13 still continuing to do that effort -- we went
14 back to every single well that they had
15 entered information in and we are reviewing
16 the data that they took from the well files,
17 and they populated it as a means of QCing
18 that information that was put in at that
19 time.
20 Q Okay --
21 A So if they entered the data in
22 2015, and we went and reviewed the data, and
23 we identified that there were errors in the
24 data that they entered, we have corrected it.
25 So the last date that that data was updated
26 is in WellView.
27 Q Okay. And, just to confirm, Mr.
28 Gruen was asking you about cleaning up, and

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1 you said, "We were digitizing." And so your
2 definition of digitize would include clean up
3 and correction per the sentence in that
4 email?
5 A Yes.
6 Q Okay.
7 MR. GRUEN: Q And with regards to that
8 sentence, "Correcting pertinent well data and
9 WellView," were the corrections of the
10 pertinent well data and WellView documented?
11 A Um, there -- I mentioned this
12 earlier, too -- I believe there was a
13 spreadsheet that they captured what the
14 vendor entered.
15 Q Yes, you did. Thank you for
16 reminding me. I remember now.
17 A Yeah.
18 Q The -- okay. If we could turn to
19 the second page, and I was -- to, in fact,
20 the last part of the second page. And you
21 see the in the first column it says, "Aliso
22 Canyon."
23 Do you see that?
24 A Yes.
25 Q And under that, then, in the next
26 column over, the entries there indicate wells
27 at Aliso; is that right?
28 A Yes.

1 Q Okay. And then the entries next to
2 those wells indicate the dates when the clean
3 up happened?
4 A Yes.
5 Q Okay.
6 A I notice a few errors in those
7 dates.
8 Q Do you want to make corrections?
9 Do you want to clarify which errors you want
10 to correct?
11 A Sure. I see that there are 2017,
12 2018, 2020, 2021, and 2019 are noted. Those
13 date are inaccurate.
14 Q And what dates should they be?
15 A I don't know. I don't remember.
16 But looking at it, I know those dates are
17 inaccurate.
18 Q Okay. It looks like the beginning
19 dates are all 2015, if I'm --
20 A Yes.
21 Q -- following.
22 Okay. Do you thing the end dates
23 would all be 2015 as well?
24 A I believe so.
25 Q Okay. So turning to the entries
26 for well SS25-A and SS25-B, do you see those
27 entries?
28 A Yes.

1 Q Okay. And so it looks like the
2 data clean up for those entries occurred
3 between November 9th, 2015 and November 13th,
4 2015.
5 Am I following correctly?
6 A Based on this, yes.
7 Q Okay. So, by my math,
8 November 9th, 2015, the first entry in those
9 is 17 days after October 23rd, 2015. And if
10 you want to correct me, please do, but that's
11 a lawyer's math. So it could be corrected,
12 it could stand corrected. But,
13 approximately, I think we're at about a
14 two-and-a-half week difference though.
15 Does that sound accurate to you?
16 A Sure.
17 Q Is it a coincidence that SS25-A and
18 SS25-B were included in the SoCal WellView
19 database integrity project 17 days after the
20 incident or approximately two-and-a-half
21 weeks after the incident, rather, at well
22 SS25 at Aliso?
23 A I don't know.
24 Q Were you or someone else
25 specifically asked to include SS25-A in the
26 SoCal WellView database integrity project?
27 A I don't remember.
28 Q Do you have any written

1 communications to that effect?
2 A I don't remember.
3 Q Was there anything different about
4 the entry of SS25-A and SS25-B into WellView
5 then the other well files that were for these
6 other wells that were entered into WellView
7 as shown on this attachment?
8 A It should have followed the same
9 criteria.
10 Q Was there anything different about
11 the prompting of SS25-A and SS25-B that
12 distinguished it from the entry of these
13 other wells into WellView?
14 A I don't remember.
15 EXAMINATION
16 BY MR. BRUNO:
17 Q Ms. Razavi, in terms of the errors
18 that you identified in this exhibit with the
19 date, where does this data come from?
20 WITNESS RAZAVI: A The vendor who
21 input the data into WellView.
22 Q So you're saying the vendor made an
23 input error?
24 A Yes.
25 Q And this whole email is about
26 correcting an error that the vendor may have
27 made. But then there's yet another error in
28 the date?

1 A Yes.
2 Q And then was that looked at? Was
3 that quality verified? Or is this the first
4 time you became aware of those dates being
5 off?
6 A It’s the first time I became aware
7 of the inaccurate dates.
8 Q Do you have a quality assurance
9 concern with this vendor?
10 A Yes. That's why we changed our
11 approach.
12 Q And what do you mean by that?
13 A We are now using another vendor and
14 QCing the data that is being inputted into
15 our WellView.
16 EXAMINATION
17 BY MR. SHER:
18 Q When did that take place, the shifted
19 to the new vendor?
20 WITNESS RAZAVI: A It was earlier this
21 year.
22 Q And so this email is your email;
23 correct?
24 A Yes.
25 Q And these documents were attached
26 to your email when you sent it around?
27 A Yes.
28 Q And this is January 2016, and we're

1 now in September 2018. And so only in the
2 last few months it was discovered that the
3 original vendor had data issues?
4 A No, actually. The Well Lifecycle
5 Resources identified that the individuals who
6 were working on these wells had -- they were
7 let go. And for some time, we continued with
8 this vendor with a new team to do the data
9 input. And then, ultimately, we switched
10 vendors from Well Lifecycle Resources to
11 another vendor.
12 Q I noticed that you picked up these
13 errors right away when you looked at the
14 document. Did you not look at the document
15 before you sent it around?
16 A I don't remember.
17 Q Okay.
18 EXAMINATION
19 BY MR. GRUEN,
20 Q To your knowledge, did the well
21 file for well SS25-A look different before
22 November 9th of 2015?
23 A I don't know.
24 Q You know why I'm using that date?
25 I'm using that date as the date that was
26 shown as the dates of the week that was
27 completed -- that SS25-A was completed in
28 WellView, as shown in this attachment to your

email. So you don't -- with that context, you don't remember if well SS25-A looked different than before it was inputted into WellView?

A I don't know. I did not look over the data that was inputted into WellView at the time.

Q Did well SS25-B look -- the data in that well file?

A I don't know.

Q Okay.

MR. SHER: Do you know why these wells -- these particular wells were selected.

WITNESS RAZAVI: I don't remember.

MR. BRUNO: Do you recall the names of the vendor's employees that were let go?

WITNESS RAZAVI: Joel, I can't remember the last name, and Israel were the first names.

MR. BRUNO: Joel and Israel?

WITNESS RAZAVI: Yes.

MR. BRUNO: Thank you.

EXAMINATION

BY MR. GRUEN:

Q You -- turning back to the email that you wrote from January 2015, Exhibit 4, I believe. It states toward the middle, the one with the bullet point, the sentence with

1 the bullet point in front of it; it's the
2 first one.
3 It says, "Phase 1: Update well
4 schematics with current information and
5 production failures, if any, (casing or
6 shoe)(casing tally, directional surveys,
7 tubing, perfs, packer, gravel packs, et
8 cetera) more detail is in the summary."
9 Do you see that?
10 WITNESS RAZAVI: A Yes.
11 Q What summary are you referring to
12 there?
13 A I don't remember.
14 WITNESS KITSON: Perhaps the first
15 attachment.
16 WITNESS RAZAVI: A Yeah. I don't
17 remember.
18 MR. GRUEN: Ms. Kitson, do you --
19 WITNESS KITSON: No, I don't know.
20 Q When reviewing this, I didn't see
21 any additional attachments. But perhaps I
22 was remised. Would you be able to check
23 based on review of your emails and find the
24 summary you're referring to in this email?
25 MS. RAZAVI: A I don't know. Was it
26 attached to this email?
27 Q I'm not sure.
28 A If it exists, yes.

1 Q Okay. Was Phase 1 complete as --
2 at the time you wrote this email?
3 A Yes, I believe so.
4 Q Did it include all the wells for
5 natural gas storage in SoCalGas's possession?
6 A I believe it was completed for the
7 wells that are in the attachment.
8 Q Oh, I see. Okay. All right.
9 Did this email in any way reflect
10 any change in the scope of work identified as
11 part of the March 4th, 2015 WellView data
12 integrity project?
13 A I don't remember. We've captured
14 the information that I've listed there.
15 And I do want to make a point of
16 clarification that I -- while I was a search
17 field engineer and started the project in
18 March 2015, when the relief well operations
19 was kicked off, I was moved from my position
20 and put on the relief well. And this is
21 during that time.
22 Q Okay. Okay.
23 MR. SHER: Who handled your duties
24 while you were put on the relief well?
25 WITNESS RAZAVI: I don't remember how
26 the hand-off worked out exactly.
27 MR. GRUEN: Q Following October 23,
28 2015, were there any changes to the scope of

1 work identified as part of the March 4th,
2 2015 well data integrity project?
3 A Can you repeat that question,
4 please?
5 Q Yeah. I'm looking at the change in
6 the scope for the WellView data integrity
7 project. So it’s just a question about
8 dates.
9 Did the scope of the WellView data
10 integrity project change following
11 October 23rd, 2015?
12 A I don't remember. I don't believe
13 so.
14 Q Okay. Not -- at least not
15 immediately after. I mean, we've established
16 that there may have been some changes at some
17 point later. But I'm asking about immediate,
18 so thank you.
19 So, continuing on. The January
20 email says in the open bullet, "During this
21 phase pertinent well history files have been
22 retrieved from DOGGR website and/or well
23 history files and scanned."
24 Do you see that?
25 A Yes.
26 Q So are these -- were these files --
27 let me just ask you.
28 For what purpose were well history

1 files retrieved from the DOGGR website?
2 A We discussed this earlier, that the
3 vendors were remote.
4 Q Yeah.
5 A And I believe since I was on the
6 relief well, I don't recall them coming
7 onsite during that time.
8 Q Okay.
9 A So they accessed the DOGGR database
10 and extracted information from DOGGR database
11 to put into WellView.
12 Q Understood. So this is referencing
13 the same --
14 A Yes.
15 Q -- relationship between the
16 third-party contractors and providing them
17 the data to DOGGR that you described to us
18 earlier when we were asking about the March
19 4th, 2015 document on the WellView data
20 integrity project?
21 A Yes.
22 Q I follow.
23 MR. SHER: Can I ask a clarifying
24 question?
25 MR. GRUEN: Yeah.
26 EXAMINATION
27 BY MR. SHER:
28 Q Just -- so it’s your testimony that

1 the third-party vendor was not using the
2 DOGGR website and DOGGR information to enter
3 missing and/or correct pertinent well data in
4 WellView; is that correct?
5 WITNESS RAZAVI: A They were using.
6 Q So, again, I understood from
7 earlier?
8 A Mm-hm.
9 Q That the third party was only using
10 the DOGGR website information because they
11 weren't onsite at Aliso, and so that
12 information wasn't with them. And it was --
13 A Correct.
14 Q -- easier to get it from DOGGR.
15 A Correct.
16 Q What I'm trying the find out now,
17 was the third-party vendor using the DOGGR
18 website and DOGGR information to enter
19 missing and/or correct pertinent well data in
20 WellView, in addition to using the website
21 because it was easier?
22 A They were using the information on
23 DOGGR website because they didn't have access
24 to the onsite well information to input the
25 data into WellView.
26 Q Okay. So they were not using the
27 DOGGR website and DOGGR information to
28 correct missing information?

1 A Well, they were populating
2 information that previously could maybe have
3 not been there. I mean, that's the whole
4 exercise with this project.
5 MR. STODDARD: I have to object. She's
6 testifying as to her recollection and
7 understanding. But she can't testify as to
8 what the third-party vendor understood itself
9 to be doing when it was pulling DOGGR
10 records. This is simply her understanding of
11 what they were doing.
12 MR. SHER: Okay. I appreciate that.
13 Q The scope of the work from the
14 third-party vendor was to update well files;
15 correct?
16 WITNESS RAZAVI: A Not well files, but
17 WellView.
18 Q WellView, thank you for that
19 correction.
20 And as part of that scope, were
21 they also tasked with entering missing and/or
22 correcting pertinent data in WellView?
23 A They were -- as part of the scope,
24 they were entering information into WellView,
25 potentially, the well information was not
26 populated in WellView because the well was
27 drilled many years ago when we didn't have
28 the database. So in that context, they were

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1 missing information in WellView, which they
2 populated the information.
3 Q Okay. So I think I'm getting this,
4 and apologize for being obtuse. It wasn't
5 that there was well data from the file
6 missing that they were going to the DOGGR
7 website to retrieve?
8 A Correct.
9 Q Okay. Thank you.
10 EXAMINATION
11 BY MR. GRUEN:
12 Q One related question -- maybe I'm
13 being equally obtuse.
14 Was the third party using DOGGR
15 information to correct pertinent well data in
16 WellView?
17 A They were using DOGGR information
18 because they weren't onsite to access the
19 well files. So they were able to get the
20 data from DOGGR remotely and populate the
21 information into WellView.
22 Q Let me just -- I've heard you say
23 that.
24 A Yes.
25 Q I'm trying to make a distinction
26 here between them -- I understood the part
27 about them being remote. Understood the part
28 about them gathering DOGGR information and

SED SUR_REPLY_002022

1 using it for purposes of populating WellView.
2 A Mm-hm.
3 Q I think Mr. Sher asked you about
4 using the DOGGR information to fill in gaps
5 in WellView where there was incomplete
6 information. Now I'm trying to supplement
7 that question and ask: In cases of
8 inaccurate information, was the third party
9 using DOGGR data to correct it where there
10 was inaccurate information in WellView?
11 A Well, they were using the available
12 information to them. Whether it was a well
13 file or well history that was on DOGGR's
14 website.
15 Q So I think the answer to that
16 question is yes, the third party was using
17 DOGGR information in order to correct
18 inaccurate information in WellView?
19 A No.
20 Q Okay. The --
21 A The information on DOGGR website
22 would be included in all hard copy well
23 files.
24 Q Okay.
25 A So they were using that information
26 to input information in WellView, so...
27 Q Okay. That suggests to me that the
28 information in the existing well file and the

SED SUR_REPLY_002023

1 information on from DOGGR was matched?
2 A Correct.
3 Q Okay. And somebody checked to be
4 sure that it was all matching?
5 A Yes. They would come on site and
6 check the well file. In this case, however,
7 I can't remember when these gentlemen were
8 let go of Well Lifecycle Resources. So while
9 they were remote and I was on the relief
10 well, during that time their only source of
11 available information was the information
12 that was on the DOGGR website.
13 Q Was there any concern given the
14 inaccuracies that were provided in the
15 attachment to the January 15th email from
16 these gentlemen, any concern that they had
17 not properly checked to see that the DOGGR
18 information had matched the well file
19 information?
20 A Yes. That's why we continued with
21 this vendor, brought a new team on, and
22 actually went through and looked at these
23 wells, I can't remember to what extent, and
24 ensured that the information that was put in
25 is correct. And, ultimately, we decided not
26 to use this vendor.
27 Q And just remind me -- you may have
28 said it, forgive me if I missed it -- at what

1 point in time did the new vendor check the
2 information on the attachment to the
3 January 15th email?
4 A So the priority is different from
5 the new vendor. They are not going by the
6 priority that this vendor had. And as a
7 point of clarification, we continued on with
8 this vendor for another, I believe
9 through 2016 -- sometime 2016, maybe 2017. I
10 can't remember the dates.
11 And then at some point we stopped
12 the effort. And we reinitiated the effort
13 earlier this year with a new vendor.
14 Q I'm not sure that answered my
15 question. And it may have, but let me just
16 be sure.
17 A Sure.
18 Q So I think -- I'm trying to
19 understand -- the vendor put some errors into
20 the attachment to your January 15th email --
21 A Mm-hm.
22 Q -- when was that vendor replaced?
23 A The -- this vendor was replaced
24 earlier this year.
25 Q Okay.
26 A But we stopped the effort with this
27 vendor, I believe -- I can't remember the
28 dates exactly, sometime last year.

1 Q Okay. And, just for the record,
2 when you say "this vendor," we're talking
3 about the vendor who did the work on the
4 attachment that's shown to your January 15th
5 exhibit?
6 A Yeah. So there were two teams with
7 this vendor that worked on WellView data
8 entry.
9 Q Okay.
10 A We had the first team that was let
11 go. And then we had the second team that
12 worked on the WellView data entry. Last year
13 sometime we stopped that effort with the
14 second team of this vendor entirely.
15 Q Okay.
16 A We restarted the new effort with
17 the new vendor this year.
18 Q Okay.
19 MR. BRUNO: Yeah. So I have a couple
20 questions.
21 EXAMINATION
22 BY MR. BRUNO:
23 Q When the new team came on with the
24 old vendor --
25 WITNESS RAZAVI: A Mm-hm.
26 Q Were they remote?
27 A They would -- same process.]
28 They would come on site, and then

1 they would scan files, and they would go off
2 site. So it was a combination of remote and
3 on site. So, yes, they were remote.
4 Q Were the errors identified -- were
5 they rampant throughout all their work or did
6 it have to do more with them being remote and
7 taking errors from the DOGGR data, or -- or
8 was it just -- was it everywhere?
9 A I don't know. I don't remember.
10 Q Why was the second team let go?
11 A We just -- the quality of the work
12 and the nature of -- of the date -- of the
13 projects that the other vendor had was closer
14 to what we were looking for. So --
15 Q And when you brought on the new
16 vendor, you said the priority changed?
17 A Yes.
18 Q Why is the vendor establishing the
19 priority?
20 A The vendor isn't. We are.
21 Q Why did the priority change?
22 A Because of the activities, we want
23 to make sure that the data that is entered
24 by -- for the workovers by our website
25 managers -- we want to make sure we don't
26 have to redo the work; so, for that reason,
27 we changed our priority. So --
28 Q And by -- I'm sorry.

A So I'll give you an example. Maybe this brings more clarity. We have a rig schedule. Right now, we look at that rig schedule, and before a rig moves onto a well, we make sure that we go in, review the data, and make sure the data is populated with all the information in the well histories. Then, when the rig moves onto that well, and they start populating information, we don't have to go back and update the data that is being entered by the rig site managers, so it's up-to-date to that point, and there -- the rig site managers are working with an up-to-date version of the well in WellView.

Q Okay. So I -- I'm going to just state what I think I understood.

When work is occurring on a well, you want -- you want to make sure that it's good data, so that'll change the priority?

A We -- it might have been helpful for us to show how WellView operates or show the software.

If the rig moves onto a well, and we start conducting activities -- or conducting activities on that well and capturing information on that well in WellView while the historical information is not entered, it requires extra effort for us

1 to go review what's -- what was done, and
2 then populate everything prior to that
3 activity. So what we do, we look at the rig
4 schedule, we get ahead of it, we go, and we
5 make sure we review the data in WellView, we
6 enter the information before they move on, so
7 when they move onto that well and they
8 populate the information and they move off,
9 that one's complete.
10 Q I understand. Are you confident
11 that the previous vendor's errors are all
12 corrected?
13 A We have a pretty rigorous process
14 in place now. So --
15 Q Could you describe that process?
16 A The vendor who is entering the
17 information is the same vendor that has
18 developed our wellbore diagrams that we've
19 provided to DOGGR as part of the permitting
20 process, and that data has been reviewed by
21 SoCalGas and the storage field engineers. So
22 that data has been QC'd by our engineers. So
23 we use that data, and we populate WellView.
24 So, in that sense, there has been a QC
25 process in place.
26 Q Are they -- your -- your QC
27 engineers at SoCalGas, are they -- are they
28 doing that on a sample basis or a population

basis?

A No, for every -- for every well that they have to be -- they have the workover on and they have to get permitted for, they have to review the data.

Q Review the data. But, do they go back to source data to verify it's accurate?

A You mean the well file?

Q I have -- I'm -- I'm a little confused now.

I understood what you just said to mean that, if they're going to do work, they will go back and review the data.

A Uh-huh.

Q But, I'm asking about making sure that there's no errors that carry over from the old vendor to the new vendor. So I thought what you had -- I thought what you were explaining is that "Q" -- QC/QA process --

A Right.

Q -- happens by the -- SoCalGas?

A Engineers, correct.

Q So are they -- are -- so they're looking at every single well every single time they touch a well?

A Yes.

Q And what if they do it ten more

1 times in ten years, do they do it each time?
2 A Well, they have to review the well
3 history and make sure they know that well in
4 order to plan for the work. So they have to
5 review that.
6 Q But, that --
7 A That's my perspective, though. I
8 should only speak to what I understand. I
9 mean someone from operations could probably
10 answer your question better.
11 Q Okay. I guess what I'm getting at
12 is that you describe quality control by
13 SoCalGas, but is that really a process to
14 determine if all the errors are corrected
15 from the previous vendor? I mean there's
16 a -- I'm hearing a distinction between
17 understanding the --
18 A Uh-huh.
19 Q -- changes in the well versus
20 whether or not you have a level of assurance
21 that the data is accurate.
22 So I'm -- my -- my question is
23 really is SoCalGas confident that the new
24 vendor's correcting the errors of the
25 previous vendor?
26 A To the extent that the engineers
27 review the information and bless that
28 information, I can only speak to that. I

1 don't review the data myself. So --
2 Q Has the data been audited?
3 A In what sense?
4 Q Has the data been looked at by a --
5 somebody familiar with generally accepted
6 accounting principles or generally accepted
7 auditing standards, and verified that there
8 are no carryover errors?
9 A Not that I'm aware of.
10 Q As a data manager, is that --
11 A Uh-huh.
12 Q -- important to you?
13 A Very much so, yes.
14 Q Do you think it might be a good
15 idea to do an audit?
16 A Yes.
17 Q Have you -- have you mentioned that
18 to SoCalGas?
19 A We have processes in -- and plans
20 in place to conduct audits, and we have tools
21 to conduct audits, and we're currently in the
22 process of enhancing those tools so it --
23 they can be better utilized.
24 Q To your knowledge, has an audit
25 been conducted on the data that we're
26 referring to in -- in WellView?
27 A I don't remember.
28 Q Okay. I want to ask you a slightly

1 different -- well, not slightly. I want to
2 ask you a different question now.
3 A Sure.
4 Q What did you do on the relief well?
5 A I helped with logistics on that
6 well that -- I helped the drilling manager
7 with logistic -- logistical tasks and
8 activities.
9 Q And the drilling manager was?
10 A Todd Van de Putte.
11 Q Todd Van de Putte.
12 Do you know approximately when you
13 shifted over to the relief well?
14 A Before the spud date; so as soon as
15 they started the relief well, I was there.
16 Q And did you understand the purpose
17 of the relief well?
18 A Yes.
19 Q Which was?
20 A To intersect the leaking well, and
21 stop the leak by pumping cement.
22 MR. BRUNO: Okay.
23 EXAMINATION
24 BY MR. SHER:
25 Q The process that you described of
26 trying to get ahead of the rig schedule so
27 you would know -- operations would, I assume,
28 alert somebody that you need to get a rig

1 over a well at a certain time, and so your
2 team would get ahead of that schedule to make
3 sure that WellView is populated for that
4 well --
5 A That's a -- I just want to make a
6 point of clarification. My team was formed
7 recently, and that's a recent process post
8 leak. So --
9 Q Okay. So that -- that gets to
10 my -- my -- my question, which was that that
11 process, then, wasn't in place on
12 October 3rd, 2015, of getting ahead of the
13 rig overwork?
14 MR. GRUEN: October 23rd --
15 MR. SHER: Thank you.
16 MR. GRUEN: -- 2015.
17 MR. SHER: Yes.
18 WITNESS RAZAVI: A I can't remember
19 how I prioritized the data cleanup project.
20 I might have looked at the rig schedule
21 still, at that point of time, as well.
22 MR. SHER: Q Does the attachment to
23 the 20 -- the January 15, 2016 email that
24 we've been talking about -- it indicates that
25 the WellView cleanup and correction took
26 place during 11-9-15 through 11-13, and then
27 the date on the end is wrong, I'm assuming.
28 Is that correct?

1 WITNESS RAZAVI: A Sorry. Where --
2 what are you referring to, which field?
3 Q The last page --
4 A The last page.
5 Q -- Aliso Canyon, SS-25.
6 So the WellView cleanup work that
7 took place on SS-25 obviously occurred after
8 the first time a rig was put over SS-25. Is
9 that correct?
10 MS. CLORFEINE: Mr. Sher, there's --
11 MR. STODDARD: For the --
12 MS. CLORFEINE: Yeah. For the record,
13 it's 25-A and 25-B. If it says, "25," it's
14 not on this.
15 MR. SHER: Sorry.
16 Q With regards to SS-25-A and 25-B,
17 it seems that work on the WellView cleanup
18 took place after the first rig was put over
19 the well to try and stop the leak. Is that
20 correct?
21 WITNESS RAZAVI: A It -- for SS-25-A
22 and "B," the data cleanup effort started on
23 November 9th --
24 Q Uh-huh.
25 A -- which is after the SS-25 --
26 Q Leak?
27 A -- leak, yes.
28 Q So again, I'm just trying to get

1 this -- this process that you have in place
2 now --
3 A Yes.
4 Q -- you try and get ahead of the rig
5 schedule --
6 A Correct.
7 Q -- did not occur with regards to
8 the October 23rd, 2015 leak?
9 A Prior to the leak, I had not worked
10 on the Aliso Canyon wells; rather, we worked
11 on the other storage fields. And I don't
12 recall -- I don't remember if I looked at rig
13 schedules back then.
14 Q But, the dates sort of speak for
15 themselves, don't they?
16 A I don't know when the rig moved on
17 SS-25-A and "B" or if there was a rig moved
18 onto those wells.
19 MR. SHER: Great.
20 EXAMINATION
21 BY MR. GRUEN:
22 Q Just with regards to the -- the
23 wells on the -- the list attached to your
24 January 15th email of 2016, upon completion
25 of the wells on this list, what was the
26 practice of SoCalGas with regards to using
27 WellView? Was it -- did -- was WellView used
28 immediately for the files listed, once they

1 were complete?
2 A WellView was used for workover,
3 drilling and abandonment activities.
4 Q And specifically for SS-25, was
5 WellView used once it was complete, once
6 SS-25-A and SS-25-B were complete on
7 November 13th, 2015?
8 A Are you referring to SS-25 or
9 SS-25-A or "B."
10 Q Excuse me, SS-25. Was SS-25 --
11 upon completion of SS-25-A and "B" in
12 November 13, 2015, was WellView accessed in
13 order to use the completed well information?
14 A SS-25 is a separate well --
15 Q I understand.
16 A -- than SS-25-A and "B."
17 Q Thank you for the clarification.
18 Yeah.
19 A Uh-huh.
20 Q So for SS-20 -- I may not have
21 included SS-25-A and "B."
22 Upon completion of SS-25-A and "B"
23 here, was the information used as soon as it
24 was complete?
25 A I don't know.
26 MR. GRUEN: Okay. Any other questions
27 on this topic?
28 Okay. Go off the record for a

1 second.
2 (Off the record.)
3 MR. GRUEN: On the record.
4 My notes show, even though it was
5 cut off, unfortunately, that this was marked
6 with Bates stamp AC_CPUC_SED_Kitson_0000946.
7 If that is incorrect, we will clarify that at
8 a later time.
9 Q And Ms. Razavi, this is -- I see
10 here, this is an email from you to Thomas
11 Egbert, Azra Kargar and Amy Kitson dated
12 January 29, 2016, and the subject line
13 includes an initial response -- an initial
14 email and response emails regarding Aliso
15 Canyon wells. And this thread was
16 communicated in its entirety, it appears, on
17 January 29th, 2016.
18 Does that appear accurate to you?
19 WITNESS RAZAVI: A That's what the
20 document says.
21 Q Yeah, just for recognition
22 purposes --
23 A Yes.
24 Q -- for the record. Thank you.
25 And at the bottom of this page,
26 you're asking Tom Egbert and Azra Razavi
27 (sic) to review the attached report from
28 Maximo and under EQ function and fill in the

1 functionality of the well, INJ/WD/FLOOD/water
2 disposal, IDLE, etc., close paren.
3 Do you see that?
4 A Yes. Just for clarification --
5 Q Yeah.
6 A -- it was to Azra Kargar. I think
7 you mentioned my last name. I just wanted to
8 make sure.
9 Q Ah, excuse me. Thank you for the
10 clarification. I appreciate that.
11 Just -- you had explained Maximo
12 earlier, and if you wouldn't mind doing it
13 briefly once more, would you? What is
14 Maximo?
15 A It's a maintenance management
16 system.
17 Q Okay. And what is the source of
18 data for the Maximo report? I'm referring to
19 where, at the bottom, from you to Tom Egbert
20 and Azra Kargar, cc'g Amy Kitson, "Azra and
21 Tom," you say, "could you please review the
22 attached report from Maximo?"
23 A Is there an attachment to this
24 email?
25 Q I could ask you. I didn't see one.
26 A Without that, I don't know what
27 this email is regarding; but --
28 Q Yeah.

1 A -- it looks like I'm asking them to
2 fill in a spreadsheet with the functionality
3 of the wells.
4 Q Yeah. Okay. How would we ask
5 for -- for the Maximo report that's
6 referenced here?
7 A I guess however this email was
8 produced --
9 Q Okay.
10 A -- as far as an attachment.
11 MR. GRUEN: Okay. Do you know -- so
12 can we request that -- that Maximo report
13 that's referred to here? It's -- the reason
14 I'm asking for it is we just didn't see it in
15 the production. So --
16 MR. STODDARD: Yeah, it looks like,
17 based on -- we'll see -- yeah, we'll see if
18 we can locate it.
19 MR. GRUEN: Okay.
20 MR. STODDARD: It doesn't appear --
21 well, as odd as it sounds like, based on the
22 description, it looks like it might have been
23 attached to the Thomas Egbert email --
24 MR. GRUEN: Uh-huh.
25 MR. STODDARD: -- because this is my
26 first pass.
27 MR. GRUEN: Okay.
28 MR. STODDARD: But, I don't know. We

1 can check.
2 MR. GRUEN: Okay.
3 MR. STODDARD: Because there's no
4 attachment on it.
5 MS. CLORFEINE: We'll look for it.
6 MR. GRUEN: All right.
7 Q Ms. Razavi, what is the source of
8 data for the Maximo report, do you know?
9 WITNESS RAZAVI: A It has to be in
10 context. I'm not sure what exactly I'm
11 referring to --
12 Q All right.
13 A -- in here.
14 Q All right. We'll ask for it, then,
15 and move on.
16 Where you say the -- at -- at
17 that -- at the bottom of the page,
18 "Also, you are the most familiar
19 with the wells. If there are
20 wells missing please note them."
21 Do you see that?
22 A Yes.
23 Q Okay. Did Thomas Egbert, Azra
24 Kargar or anyone else add any wells to the
25 list that you provided?
26 A I -- without seeing the list, I
27 don't know.
28 Q Okay. Was -- were Thomas Egbert or

1 Azra Kargar -- did you ask them to update or
2 in any way correct the information that was
3 provided into WellView?
4 A I don't remember.
5 Q Okay. Do you remember asking
6 anyone to update or correct information that
7 was provided into WellView?
8 A What timeframe?
9 Q As part of the WellView data
10 integrity project and the timing -- the
11 timeframe -- so beginning in March of 2015.
12 A So the entire underground storage
13 staff had access to WellView, read and write
14 access; so whether they accessed WellView and
15 changed information and entered the data into
16 it, that was not under my control or
17 supervision.
18 Q Okay. At the top of the email
19 where it says, "I'm realigning this sheet
20 with what's on DOGGR website," do you see
21 that?
22 A Yes.
23 Q And where you realigned the sheet
24 with what's on DOGGR's website, which piece
25 of information changed? Did you change the
26 DOGGR website to match what was on the sheet
27 referenced here or did you change what was on
28 the sheet here to match what was on DOGGR's

1 website?
2 A Without seeing the list, I don't
3 know what I was trying to do here.
4 MR. GRUEN: I think we'll have to DR
5 it, and ask. These are questions that we
6 need to get at.
7 Okay. Any -- any follow-up
8 questions?
9 MR. BRUNO: No. I think you should
10 move on from that sheet.
11 MR. GRUEN: Okay. So the -- let's go
12 off the record, please.
13 (Off the record.)
14 MR. GRUEN: So back on the record.
15 So -- oh, gee. I think the -- the
16 email from Avi Razavi dated January 29th,
17 2016, is Exhibit 5 (sic), marked as Exhibit 5
18 (sic), please.
19 (Exhibit No. SED-04 was marked for identification.)
20
21 WITNESS RAZAVI: Sorry. What are you
22 referring to?
23 MR. GRUEN: I'm remembering to mark the
24 last email --
25 WITNESS RAZAVI: Oh.
26 MR. GRUEN: -- that I just -- excuse
27 me.
28 And -- and this email, I believe,

1 Bates stamp AC_CPUC_SED_KITSON_0000820, is an
2 email from Christian Ching, C-h-i-n-g, dated
3 January 5th, 2016. It's part of a thread
4 that extends back to January 4th, 2016,
5 emails from Mike Dozier and Azra Kargar. The
6 subject is Re: SS9 and P26C well history
7 files.
8 Q Ms. Razavi, does that look accurate
9 to you?
10 WITNESS RAZAVI: A That's what's on
11 the paper.
12 Q Very good. And -- and you are
13 included in each email as part of this email
14 thread. Is that right?
15 A Uh-huh.
16 Q Do you recall receiving these --
17 this email thread?
18 A I recall, now that I see the email.
19 Q And it refreshes your recollection?
20 A (Nods.)
21 Q Okay. So with regards to this --
22 the gist of this, as I understand it, is that
23 Mike Dozier -- I'm sorry, Azra Kargar is
24 asking about well history files SS9 and P26C
25 on January 4th. Is that right?
26 A That's what's on the email, yes.
27 Q And -- and so, this basically is an
28 email thread showing that the well history

1 files from those two wells are not available
2 in the file cabinet. Correct?
3 A That's what it says in the email.
4 Q Have the well history files for SS9
5 been -- has the well history file for SS9
6 been found?
7 A I don't know.
8 Q Has the well history file for P26C
9 been found?
10 A I don't know.
11 Q Looking back to the January 15th,
12 2016 email that you have in front of you and
13 the attached document, if you would --
14 WITNESS KITSON: Sorry.
15 MR. GRUEN: Q So, if you look at the
16 very bottom of the last sheet under "Aliso
17 Canyon," and you see that the well -- you see
18 well SS9?
19 WITNESS RAZAVI: A Yes.
20 Q And that it was completed
21 January -- excuse me, November 9th, 2015
22 through November 13th, 2015, I believe we've
23 established. Is that accurate?
24 A Yes.
25 Q So let me understand the order of
26 events here.
27 SS9 was completed in WellView in
28 November of 2015, but SS9 was not in the file

1 cabinet in January of 2016?
2 MR. STODDARD: Objection, this email is
3 neither from nor to Avi. Although she is
4 addressed on it, she can't -- all she can do
5 is confirm what the email says. She did not
6 confirm the fact that these were not actually
7 in the right -- in the -- in the well -- in
8 the file cabinet.
9 MR. GRUEN: Okay. Well, we want to ask
10 for a data request to please -- if SoCalGas
11 will please produce SS9 and the version of
12 the well -- and the version of the well file
13 that existed in January 2015, and see if --
14 if this -- if, in fact, SoCalGas has the well
15 file, please.
16 MR. SHER: Darryl, may I?
17 MR. GRUEN: Yeah.
18
19 EXAMINATION
20 BY MR. SHER:
21 Q Ms. Razavi, do you have any reason
22 to doubt the veracity of this email and the
23 contents therein, and this email being the
24 one that's dated -- there are two dates, 1-4,
25 2016 -- I believe it's been marked as
26 Exhibit 6.
27 A I'm sorry. Could you repeat your
28 question?

1 Q Do you have any reason to doubt the
2 veracity of the contents of this email?
3 A Sorry. What does veracity mean?
4 MR. GRUEN: Accuracy.
5 MR. SHER: Q Do you -- yes.
6 Do you doubt the accuracy or the
7 truth of the words in this email?
8 WITNESS RAZAVI: A I did not write it,
9 so I can't really judge that. But, that's
10 what it says, so I read what it says.
11 MR. STODDARD: To be clear on the data
12 request, just because I started to -- to
13 write it down as you were asking for it, but
14 there were a few -- you kind of rephrased it.
15 And just to be clear, what you're
16 wanting is just for SS9 the well file as it
17 existed as of the date of this email or as of
18 the date of -- it wasn't -- I missed what
19 it's as of the date of.
20 MR. GRUEN: The -- the Well SS9 -- the
21 well file, do you have it today, what the
22 state of it was -- rather, did you have it
23 on -- did SoCalGas have it on January 4th and
24 5th, 2016, and if not, when did SoCalGas find
25 the file, and where was it. Yeah.
26 EXAMINATION
27 BY MR. GRUEN:
28 Q And regarding the follow-up to

1 Mr. Sher's question, Ms. Razavi, to your
2 knowledge, did anyone follow up to find out
3 if Well SS9 had been found after this email
4 thread?
5 A I do -- I don't know.
6 Q Okay.
7 A I do want to make a point of
8 clarification. The data that was completed
9 during these -- the months of November,
10 December up until the time that I was on the
11 relief well, I don't recall the vendor being
12 on site, so I believe the vendor accessed the
13 DOGGR database; but, I can't be sure.
14 Q Understood.
15 EXAMINATION
16 BY MR. SHER:
17 Q Just following up on that, so it
18 could be possible, then, that while Mr. Azra
19 Kargar can't find the files -- I'm assuming
20 at Aliso Canyon -- in the file cabinet, that
21 this information may still have been input
22 into WellView?
23 A Well, based on this sheet, the data
24 was inputted into WellView in 2015 for SS9,
25 but I don't know if the vendor actually
26 accessed the hard copy, hard well files,
27 rather the DOGGR database.
28 Q So then, I think the answer is

1 "Yes," that the vendor didn't need the actual
2 well file, which couldn't be found based on
3 that email, in order to accurately input data
4 into WellView?
5 A That's not what I said. The vendor
6 was not on site to access the well file, so
7 the vendor remotely accessed the DOGGR
8 website.
9 MR. SHER: Okay. Thank you.
10 EXAMINATION
11 BY MR. SHER:
12 Q And Ms. Razavi, just with reference
13 to the data management system where the wells
14 files were -- had been put, entered -- and I
15 believe electronically, if I'm not mistaken.
16 Is that right?
17 WITNESS RAZAVI: A No. We were in the
18 process of --
19 Q Okay.
20 A -- scanning and moving into a
21 document management system.
22 Q I see. And is -- would -- once
23 information was put into WellView, would a --
24 would a well file have been scanned into the
25 data management system?
26 A Not necessarily.
27 Q Okay. So you don't know whether
28 SS9 was scanned into the data management

1 system as of January 4th and 5th during the
2 date of this email?
3 A I don't know.
4 EXAMINATION
5 BY MR. BRUNO:
6 Q To your knowledge, are there any
7 missing well files at Aliso Canyon at this
8 point in time?
9 WITNESS RAZAVI: A I don't know.
10 Q Why don't you know that?
11 A Because we are focused on
12 digitizing on -- as systems, and putting
13 governance around the processes that we have
14 for data collection for records management.
15 Q If there was a missing tangible
16 well file, who's the responsible manager in
17 charge?
18 A The underground storage group,
19 because they use the well files.
20 Q Is the underground storage group a
21 responsible manager? Or I -- let me rephrase
22 that.
23 Is there a responsible manager in
24 the underground storage group, or -- or is
25 the whole group in charge?
26 A The whole group, because they have
27 different -- the organization is set up that
28 pieces of information is managed through

1 different groups.
2 Q So based on your -- your -- your
3 time at SoCalGas and, you know, in data
4 management, if you will, are you familiar
5 that well files go missing at times?
6 A Not that I'm aware of.
7 Q So is this the first time you've
8 ever heard of a well file went missing?
9 A I'm not in -- at that time, this is
10 what I received. So that's the first time I
11 saw that a --
12 Q Why do you --
13 A -- well file wasn't there.
14 Q I'm sorry. Did -- I might have cut
15 you off.
16 A So that's the first time I saw that
17 a well file was missing --
18 Q Okay.
19 A -- in that email.
20 Q Do you know why they included you
21 in the email chain?
22 A No, I don't.
23 Q And Ms. Kitson, are you familiar
24 with any well files that were going missing
25 at Aliso Canyon?
26 WITNESS KITSON: A I'm not familiar
27 with any gone missing.
28 Q Do you know if these two well files

1 were ever found?
2 MR. STODDARD: Again, objection, I --
3 as to characterization that they were missing
4 as opposed to just this -- you know, maybe
5 these individuals not knowing where just to
6 specifically look for them, or any other
7 possible circumstances.
8 EXAMINATION
9 BY MR. SHER:
10 Q Just for clarification, to either
11 Ms. Kitson or Ms. Razavi, would well files at
12 Aliso Canyon, physical well files, be kept
13 anywhere other than the file cabinet for well
14 files at Aliso?
15 WITNESS KITSON: A So speculation, I
16 mean because it's not my group where I'm at,
17 but assuming, if there was work going on on a
18 well file, somebody might have it at their
19 desk or, you know, may have had it outside,
20 and then replaced it when that work is done.
21 So --
22 Q And so, based on your earlier
23 testimony, we would be able to track that
24 removal of the well file based on the log
25 sheet. Is that correct?
26 WITNESS RAZAVI: A I've seen the log
27 sheet. I don't know if it was used at the
28 time.

1 Q And in your experience as a data
2 manager, would there be anywhere else other
3 than the Aliso Canyon well file cabinets that
4 well files could be, other than at someone's
5 desk who's working on that file?
6 A Not that I'm aware of.
7 MR. GRUEN: Okay. Can we go off the
8 record for a moment?
9 (Off the record.)
10 MR. GRUEN: Back on the record, please.
11 EXAMINATION
12 BY MR. GRUEN:
13 Q Ms. Kitson, if I identify this to
14 you -- I believe this is the Bates stamps in
15 your data set with the -- your last name with
16 the Bates numbers 00006182 to 0000625. It's
17 an email from Nadia Aftab, December 8th,
18 2015, and it includes you as one of the two
19 recipients, and it is -- the subject is Re:
20 AC Integrity Program, attachments AC IMP
21 Rev 1.docx, and it has a -- it appears to
22 have an attachment in the email.
23 Upon seeing this, does this refresh
24 your recollection seeing this -- receiving
25 this document?
26 WITNESS KITSON: A Honestly, no.
27 Q Okay. That may cut the questions
28 short.

1 A Sorry.
2 Q Are you familiar with the Aliso
3 Canyon Integrity Management Program?
4 A So we never specifically -- that's
5 why I'm not familiar with this. So when we
6 developed our risk management program
7 documentation in 2016, and then following on
8 to our Storage Integrity Management Program,
9 it was called that as a program for all
10 fields. We did not have a field-specific --
11 Q Ah.
12 A -- document.
13 Q So -- so there was never an Aliso
14 Canyon Integrity Management Program that came
15 to fruition?
16 A Correct.
17 Q Okay. With regards -- nonetheless,
18 just with this document --
19 A Uh-huh.
20 Q -- on page 2 of 7, just the program
21 description, "The Aliso Canyon Integrity
22 Management Program is associated with a
23 focused safety, system integrity, and risk
24 management effort," does that sentence --
25 would you expect that to apply to the general
26 overall Storage Integrity Management Program
27 of SoCalGas?
28 A I think that's fair to say. That's

1 an integrity management statement.
2 Q Okay. And similarly, if you would
3 turn to page 5 of 7, where it says,
4 "Recordkeeping," and it says, quoting from
5 the document,
6 "The storage and access to
7 important records is an
8 essential part of the Program,
9 Depending on the type of data,
10 existing systems currently in
11 place (for example, Wellview,
12 network server) will be used to
13 store and retrieve information
14 such as well historical data,
15 maps, and operating history."
16 Would that also be an applicable
17 statement generally to the Storage Integrity
18 Management Program?
19 A Yeah, I would say recordkeeping is
20 a very important part of the Storage
21 Integrity Management Program.
22 Q Thank you. And turning -- I didn't
23 clarify this off the record, and I'll give
24 you a moment, if you want to see it and --
25 and review it, page 7 of 7, the last page,
26 which really just includes Appendix B and an
27 icon.
28 A Okay.

1 Q And if you want a chance to digest
2 that, I appreciate that. We can go off the
3 record, if you'd like.
4 A That's fine.
5 Q Okay. So again, just -- the icon
6 says, "SIMP Folder Structure - Rev1.pdf."
7 And I'm -- I need to ask some questions,
8 because I didn't recognize this document in
9 what we were provided. I didn't see it.
10 It's not to say it wasn't there.
11 But, are you familiar with the SIMP
12 folder structure?
13 A I don't -- I would have to see it.
14 Q Okay.
15 A But, I'm not familiar with this on
16 first sight.
17 Q Okay. Well, is the -- is the
18 concept of a SIMP folder structure familiar
19 to you?
20 A Yes. That's part of what Avi's
21 team was working on, as she mentioned, with
22 the records document management system, is
23 putting in a structure, a naming convention,
24 et cetera, for filing away records.
25 Q And even -- your point is noted
26 that there was never a -- a -- an integrity
27 management program for Aliso Canyon created.
28 But --

1 A They were incorporated in our --
2 the entire integrity management program for
3 all fields, and we have, you know, various
4 sections of that plan, one being
5 recordkeeping, one being data management.
6 So --
7 Q And --
8 A But, certainly, Aliso Canyon was
9 part of our full plan. We just didn't write
10 it specifically for it.
11 Q I follow. And so, there is a
12 folder structure, then, that Ms. Razavi, you
13 were working on for the Storage Integrity
14 Management Program?
15 WITNESS RAZAVI: A Not necessarily
16 just for Storage Integrity Management
17 Program, but in general for underground
18 storage and working on a -- we've worked on a
19 folder structure in 2017.
20 Q And what does the folder structure
21 entail? Is it -- is it like the -- is it the
22 same thing as the data management system for
23 hard copy well files?
24 A It's a records repository, and the
25 records would be put into this folder
26 structure --
27 Q Okay.
28 A -- as a means to migrate into a

1 document management system.
2 WITNESS KITSON: A And to ensure
3 consistency, to ensure that all fields and
4 all engineers are filing the same records the
5 same way, so that we can easily query or
6 retrieve them --
7 Q Okay.
8 A -- in the future.
9 Q Okay. Okay. So I think where I'm
10 struggling is that -- that you've got two
11 things, a data management system, and then a
12 folder structure, and the folder structure
13 feeds into the data management system. Is
14 that a fair way to characterize it?
15 WITNESS RAZAVI: A (Shakes head.)
16 Q No? I'm seeing you shake your
17 head.
18 A Yeah. No.
19 Q Okay.
20 A The folder structure is for
21 records, and the data management system is
22 for the data, the tabular data.
23 Q Okay. And so the -- the folder
24 structure is -- does -- that keeps scanned
25 versions of the hard copy well files, then?
26 A It will.
27 Q Oh, it's not in place yet?
28 A It is in place, and it's being used

1 actively. It was implemented last year.
2 Q And --
3 A And before that, there was a
4 structure, which I wasn't part of that
5 effort. So when I or my team started looking
6 at the folder structure for records, our
7 purpose was to have the structure and enhance
8 what was already in place, in order to
9 prepare for migration into a document
10 management system.
11 Q Okay. Is the folder structure
12 and -- and are the documents in the folder
13 structure used by engineers in order to -- to
14 do their work on -- on wells at Aliso?
15 A I can speak from my perspective,
16 yes; but, operations need to speak on their
17 own behalf.
18 Q How do you use them in the course
19 of your daily work?
20 A Me?
21 Q Yes.
22 A If I need to access information on
23 a well or records on a well, I use the folder
24 structure to find those records.
25 Q But, not the -- the -- do you use
26 the data management system, as well?
27 A Yes.
28 Q And WellView?

A Yes.

Q All three things.

So there's a third thing that you're using, as well?

A No, data management system is WellView.

Q Understood.

A Yes.

Q I think I see why you're lumping them together. The SIMP folder structure you are using, also, as another source of information?

A I'm not familiar with the SIMP folder structure. The folder structure I'm referring to was implemented by my team last year.

Q Oh, for --

A It is a records folder structure.

Q You did say that. I appreciate that. Thank you. Okay.

So your -- you haven't seen a SIMP folder structure document like the one that's identified at the end of page 7 of 7?

A Without seeing the documents, I'm not able to say if I've seen it or not. I don't know.

Q Have you heard of a SIMP folder structure before?

1 A I don't recall.
2 Q Okay. All right. Thank you.
3 Any other questions?
4 Let's go off the record.
5 (Off the record.)
6 MR. GRUEN: Let's go back on the
7 record.
8 Thank you for appearing today,
9 Ms. Kitson, Ms. Razavi. You are excused.
10 WITNESS KITSON: Thank you.
11 WITNESS RAZAVI: Thank you.
12 MR. GRUEN: Let's go off the record.
13 (Whereupon, at the hour of 4:03
14 p.m., the Commission then adjourned.)
15 * * * * *]
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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, KARLY POWERS, Certified Shorthand Reporter No. 13991, in and for the State of California do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on October 2, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 2nd day of October, 2018.

KARLY POWERS
CSR No.#13991

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, JASON STACEY, Certified Shorthand Reporter No. 14092, in and for the State of California do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on October 2, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 2nd day of October, 2018.

Jason A. Stacey
CSR No. 14092

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

CERTIFICATION OF TRANSCRIPT OF PROCEEDING

I, Rebekah L. De Rosa, Certified Shorthand Reporter No. 8708, in and for the State of California, do hereby certify that the pages of this transcript prepared by me comprise a full, true, and correct transcript of the testimony and proceedings held in this matter on October 2, 2018.

I further certify that I have no interest in the events of the matter or the outcome of the proceeding.

EXECUTED this 2nd day of October, 2018.

Rebekah L. De Rosa

Rebekah L. De Rosa
CSR No. 8708

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED OCTOBER 24, 2018

SOCALGAS RESPONSE DATED NOVEMBER 30, 2018

SoCalGas provides the following Responses to the CPUC-Safety and Enforcement Division's (CPUC-SED) data request dated October 24, 2018 related to the preliminary investigation regarding the Aliso Canyon Well Leak. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding before any court, action. Finally, at the time of this Response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

Question 1:

For this set of questions, please reference Attachment 1, an email data request from Maria C. Solis on 11/13/18 and the corresponding data response email from Jeff Koski question #1 (attachment 1 and 2).

a. Please complete this time and provide a timeline of events to date. Please also include and identify all well kill plans between 10/23/15 and the final well kill and well abandonment on 2/28/16.

b. Please also include all activities relating to unplanned well kill plans developed by Storage Engineering per Company Operations Standard, Well Operations – Well Kill 224.0030.[1]

c. Also, include details of all fluids used during well kill attempts per Section 4.2 of the same procedure referenced in question 1b.

d. Also, include each version of the entire well file for SS-25 that was provided

[1] For reference, Section 4.1.1 states, "This document provides guidelines for routine, planned kill jobs. Emergency kills that are performed because of unplanned conditions that may result in uncontrolled discharge of gas require special procedures for each case. Special kill plans for emergency conditions are prepared by **Storage Engineering."**

to Storage Engineering and/or others that participated in developing the plans for each well kill event.

e. Also include from Company Operations Standard, Well Operations – Well Kill 224.0030 Section 1.1 the names of all individuals, and their qualifications in compliance with Section 1.1 of the procedure below.

f. In addition, include all consultants and contactors that were used to assist with every well kill attempt in compliance with Section 1.1 of the procedure.[2] As part of this exercise, please name each individual, specify who they were managed by, and provide their applicable individual scope of work included within their consultant agreements or construction contracts. Please include this information on a spreadsheet that lists at a minimum the following: Name, Title, Company of Employment, Qualifications, Duties from 10-23-15 to 2/28/16.

g. Per Section 5.0 Records, please also provide records from the Rig Supervisor and all Daily Activity Reports related to each well kill attempt.[3]

h. Please provide all information related to Company Operations Standard, Routine Well Kills, 224.0045 and Company Operations Standard, Well Operations – Well Kill, 224.0030, including what specific sections of these procedures if any were utilized during any of the well kill attempts and how these procedures were specifically implemented.

i. Also, include the information provided in response to question 1h on the timeline provided in response to question 1 (a) above.

j. For questions 1 a-d and h above please provide at a minimum the following information in table form with accompanying records referenced.

   i. Project-specific "data"[4] information used on each well kill attempt project:
   ii. Provide the recorded sources of information and data that SCG used to

[2] "Section 1.1 The **Storage Field Engineer** is responsible for well kills. Responsibility may be delegated to certain other **Company** personnel in some circumstances. The person in charge, in accordance with pre-arranged kill plans immediately handles emergency kill jobs. The **Storage Operations Manager** and **Storage Engineering Manager** are informed of such incidents as soon as practical."

[3] As stated under Section 5.0, "Section 5.2. If the well is killed by a **Rig Supervisor**, attach these records to the Daily Activity Report. If the well is killed by someone other than a **Rig Supervisor**, retain these records in the field well file.

[4] The meaning of "data" includes, but is not limited to: kill fluid pump rate, reservoir flow rate to be overcome by pump rate, kill fluid composition, kill fluid weight, reservoir pressure and etcetera and all final calculations used for each "data" element.

control and kill well Standard SS-25.

iii. Provide records of what information data set and engineering calculations were provided to each lead decision maker and what final kill-program analysis was agreed upon for each kill attempt.

iv. Provide records of names of individuals who approved the final work plan on each kill-attempt project.

v. Reference all SoCalGas procedures followed that SoCalGas has not previously identified. Include reference to the section number and quote the passage.

vi. Reference all applicable SoCalGas procedures that SoCalGas believes it did not follow. Include reference to the section number and quote the passage.

vii. For all SoCalGas procedures that it did not follow, please explain the reasons for not following its own procedures.

Response 1:

a. SoCalGas objects to this request on the grounds that it is overly broad and unduly burdensome, and vague and ambiguous as to the phrase "timeline of events to date." Notwithstanding these objections, SoCalGas responds as follows: SoCalGas believes that CPUC-SED is requesting a daily description of operations for the SS25 incident. This information is available in the SoCalGas Daily Operations Report and Boots & Coots Daily Report. Please see the following electronic documents previously provided to CPUC-SED:

- SoCalGas SS25 and P39A Daily Operations Reports (AC_CPUC_SED_DR_16_0000361 – AC_CPUC_SED_DR_16_0001026).
- Boots & Coots SS25 and P39A Daily Reports (AC_CPUC_SED_DR_16_0025631 – AC_CPUC_SED_DR_16_0025808).

Please note, the final Boots & Coots well kill was performed on December 22, 2015. For the Boots & Coots well kill plans, please see previously provided electronic documents with Bates range AC_CPUC_SED_DR_16_0000349 – AC_CPUC_SED_DR_16_0000360.

On February 11, 2016, the relief well intercepted SS25 and temporarily controlled the flow of gas. On February 18, 2016, the California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) confirmed that the SS25 leak was permanently sealed. For Boots & Coots' P39A End of Job Report, please see previously provided electronic documents with Bates range AC_CPUC_SED_DR_16_0007930 – AC_CPUC_SED_DR_16_0008027. On September 13, 2018, SS25 was permanently plugged and abandoned.

b. SoCalGas objects to this request on the grounds that it is vague and ambiguous as to the phrase "all activities relating to unplanned well kill plans," and assumes facts that do not exist with respect to the application of Gas Standard 224.0030. Notwithstanding these objections, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply.

Based on CPUC-SED's question relating to Gas Standard 224.0030, SoCalGas interprets this request as seeking well kill plans developed by SoCalGas. SoCalGas performed the well kill on October 24, 2015 and prepared the plan for that well kill. Between November 13, and December 22, 2015, Boots & Coots performed six well kills. The well kill plans for the Boots & Coots well kills were prepared by Boots & Coots.

The activities relating to the well kill performed by SoCalGas on October 24, 2015, are as follows: The SS25 leak was discovered on October 23, 2015 at approximately 3:15 pm. Oleksiy Garchev (Station Operations Manager), Larry Andrews (Field Maintenance Supervisor), Ed Pena (Stations Operations Specialist), and Adrian Estrella (Station Technician) arrived at SS25 to inspect the site at 3:20 pm. The operators could smell gas and after a brief search, a hole was identified in a narrow pipe that ran between the SS25 wellhead and a pressure gauge. The valve at the wellhead was activated and the pipe leak stopped, however, the operators continued to hear gas moving in the wellhead. Mr. Andrews performed a sweep of the SS25 pad using a handheld device, and it did not register any hits for natural gas. Additional SoCalGas personnel, including Thomas Egbert (Senior Storage Field Engineer), Mike Dozier (Contracts Administrator – Gas), and John Cerulle (Gas Storage Specialist) were contacted. In addition, Todd van de Putte (Drilling Manager) and Phil Baker (Director of Storage) were notified of the situation. At approximately 7:00 pm, gas was detected on the main road at the SS25 site. All crews were removed from the area and the road was closed.

Mr. van de Putte contacted Alan Fortenberry (SoCalGas contractor) and asked him to respond to the incident and mobilize equipment to kill the well. At 10:10 pm, Mr. Fortenberry arrived on site and met with Mr. Garchev, Mr. Andrews, Mr. Egbert, Mr. Cerulle, and the operations crew. Mr. van de Putte, Mr. Dozier, and Mike Volkmar (SoCalGas Contractor) participated by telephone. Mr. Fortenberry contacted Mr. van de Putte and reported on the well kill activities at each step. In addition to mobilizing equipment for the planned well kill, the team contacted Cameron (SoCalGas contractor) to check the wellhead seal. Well kill equipment began to arrive on site in the early morning hours on Saturday, October 24. From 1:00 am to 3:00 am, Onyx Oil Services (Onyx) started setting up the equipment to kill the well. The team began filling the tanks with well kill fluid at 5:00 am. At 6:00 am, Cameron arrived and injected plastic packing to reinforce the wellhead seals, but the downhole noise continued.

The well kill procedures were conducted in the early afternoon on October 24, 2015. Prior to the well kill, Mr. Fortenberry performed two calculations to determine (1) the *weight* of the kill fluid required to kill the well, and (2) the *volume* of the kill fluid required to kill the well.[5] Prior to the well kill attempt, Mr. Fortenberry stationed personnel not involved in the pumping operation on the edges of the site to monitor for fluid. The operations crew

[5] To determine the weight required, Mr. Fortenberry obtained the true vertical depth (TVD)[5] of SS25 from the wellbore schematic and surface pressure for SS25. Based on the TVD and surface pressure, Mr. Fortenberry calculated the bottom hole pressure ((TVD x 0.000025) +1) x Surface Pressure = Bottom Hole Pressure (BHP)). An Over Balance (OB) was then added to the BHP to get the kill fluid weight required to kill the well (BHP + OB/TVD/0.052 = Kill Fluid Weight (ppg)). To determine the volume required, Mr. Fortenberry used the SS25 wellbore schematic to obtain the outside and inside diameters of the tubing and casing. With that information, Mr. Fortenberry was able to calculate the tubing, annular casing, and circular volumes (((Tbg I.D. x Tbg I.D.)/1029.4) x Measure Depth[5] = Tubing Volume); (((Csg I.D.) – (Tbg O.D. x Tbg O.D.))/1029.4) x Measured Depth = Annular Casing Volume)); (Tubing Volume + Annular Casing Volume = Circular Volume).

discussed safety measures to avoid fire and location to meet in the event of a fire. With the safety briefing complete, the kill attempt began when contractors Halliburton and Onyx injected fluid down the tubing beginning at 12:27 pm. The tubing pressure quickly increased, but the casing pressure did not. The operators next attempted to kill the well by pumping fluid into the tubing-casing annulus. During the kill attempt, operators observed cracks beginning to form in the ground around the wellhead site and gas venting from the surface. The team immediately shut down the kill attempt and retreated to the kill pump truck a few hundred yards away from the wellhead. Subsequently, Mr. Fortenberry prepared a report of the well kill activities. For this report, please see previously provided electronic document with Bates range AC_CPUC_0014306.

c. SoCalGas objects to this request on the ground that the request assumes facts that do not exist with respect to the application of Gas Standard 224.0030. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply. Based on CPUC-SED's question referencing Gas Standard 224.0030, SoCalGas interprets this request as seeking information regarding SS25 well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015. For details of the fluids used during the SoCalGas well kill on October 24, 2015, please see previously provided electronic document with Bates range AC_CPUC_0014306.

d. SoCalGas objects to this request on the ground that the request assumes facts that do not exist with respect to the application of Gas Standard 224.0030. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply. Based on CPUC-SED's question referencing Gas Standard 224.0030, SoCalGas interprets this request as seeking information regarding SS25 well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015. The SS-25 well file was available to Mr. Fortenberry who conducted the well kill on October 24, 2015. SoCalGas scanned the hard copy well file for SS-25 on or around January 2016 and these files were previously provided to CPUC-SED on February 5, 2016 and June 3, 2016 (AC_CPUC_0000023-AC_CPUC_0000759; AC_CPUC_0012338 to AC_CPUC_12389). SoCalGas interprets the "well file" to mean the hard copy well files. The well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. Please note, electronic versions of various well file records are available in WellView and the UGS Server. In addition, there are other electronic databases (e.g., Maximo and OSI Soft PI) with well related information. Most records in the well files are dated, and records are added, not removed, from the well file.

e. SoCalGas objects to this request on the grounds that the request assumes facts that do not exist with respect to the application of Gas Standard 224.0030, and vague and ambiguous as to the term "qualifications." SoCalGas further objects that the question assumes facts that do not exist – "qualifications" is not mentioned in Section 1.1 of the referenced Gas Standard therein. Notwithstanding these objections, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply. Based on CPUC-SED's question referencing Gas Standard

224.0030, SoCalGas interprets this request as seeking information regarding SS25 well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015. Please see Response 1.b.

f. SoCalGas objects to this request on the grounds that the request is overly broad and unduly burdensome, vague and ambiguous as to the terms "qualifications" and "duties," and assumes facts that do not exist with respect to the application of Gas Standard 224.0030. SoCalGas further objects to this request on the grounds that it is unintelligible in that it assumes facts that do not exist – "qualifications" and "duties" are not mentioned in Section 1.1 of the referenced Gas Standard therein. Notwithstanding these objections, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply. Based on CPUC-SED's question referencing Gas Standard 224.0030, SoCalGas interprets this request as seeking information regarding SS25 well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015. For the contractors that were used to assist with the SoCalGas well kill on October 24, 2015, please see previously provided electronic document with Bates range AC_CPUC_0014306.

g. SoCalGas objects to this request on the ground that the request assumes facts that do not exist with respect to the application of Gas Standard 224.0030. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply. Based on CPUC-SED's question referencing Gas Standard 224.0030, SoCalGas interprets this request as seeking information regarding SS25 well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015. For SoCalGas' Daily Operations Report for October 24, 2015, please see previously provided electronic document with Bates range AC_CPUC_0014306.

h. SoCalGas objects to this request on the grounds that the request is overly broad and unduly burdensome, vague and ambiguous as to the phrase "all information related to," and assumes facts that do not exist with respect to the application of Gas Standards 224.0030 and 224.0045. Notwithstanding these objections, SoCalGas responds as follows: SoCalGas Gas Standard 224.0045 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0045 does not apply. Based on CPUC-CPUC-SED's question referencing Gas Standard 224.0045, SoCalGas interprets this request as seeking information regarding SS25 well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015. See Response 1.b.

i. See Response 1.a.

j. SoCalGas objects to the instruction to "provide at a minimum the following information in table form" on the grounds that it is overbroad and unduly burdensome. Special interrogatory instructions of this nature are expressly prohibited by California Code of Civil Procedure 2030.060(d). Notwithstanding this objection, SoCalGas responds as follows: SoCalGas Gas Standard 224.0030 provides guidelines and direction for killing a gas storage well in routine situations. The kill of well SS25 was not a routine situation, therefore, Gas Standard 224.0030 does not apply. As stated in Responses 1.a-d, based on CPUC-SED's

questions referencing Gas Standard 224.0030, SoCalGas interprets these requests as relating to well kills performed by SoCalGas. SoCalGas performed the well kill on October 24, 2015.

i. See Response 1.b. For the well kill activities on October 24, 2015, Mr. Fortenberry utilized the SS25 wellbore schematic and obtained the surface pressure for SS25. Please see previously provided electronic document with Bates range AC_CPUC_0000067.

ii. SoCalGas objects to this request as vague and ambiguous as to "recorded sources of information" and "used to control and kill Standard SS-25." Notwithstanding this objection, SoCalGas responds as follows: See Response 1.b. For the well kill activities on October 24, 2015, Mr. Fortenberry utilized the SS25 wellbore schematic and obtained the surface pressure for SS25. Please see previously provided electronic document with Bates range AC_CPUC_0014306.

iii. See Response 1.b.

iv. Todd van de Putte.

v. N/A.

vi. N/A.

vii. N/A.

Question 2:

For this set of questions, please reference attachment 1, an email data request from Maria C. Solis on 11/13/18 and the corresponding data response email from Jeff Koski question #5 and #14 (see email below).

From: Koskie, W. Jeff [mailto:WKoskie@semprautilities.com]
Sent: Sunday, November 15, 2015 2:46 PM
To: Solis, Maria; Epuna, Matthewson
Cc: Gonzalez, Hector O; Smith, Paul; Bauer, Troy A.
Subject: RE: Underground Storage facilities - CPUC Data Request Response - Aliso Canyon Storage Facility

Maria/Matt,

Below are responses to final group of initial data request items.

Please let me know if you have any questions, or if I can be of any further assistance.

5. What is the initial proposed future mitigation to this type of incident.

Our first priority is to stop the flow of gas using standard practices that ensure continued safety, offer the greatest likelihood of a prompt resolution and are

appropriately tailored to the individual circumstances of this leak. Once we have the current incident under control, SoCalGas will evaluate whether anything can be done to mitigate the possibility of such incidents in the future. This evaluation will likely be part of our root cause analysis of the current incident.

14. Any initial failure investigation findings to date.

We know the well has a casing leak. Until the leak is stopped and the well is inspected, we cannot determine the extent or the cause of the failure. Root cause investigation will commence at that time.

W. Jeff Koskie, ARM
Pipeline Safety and Compliance Manager
ML SC9334
Cell Phone (213) 305-8660
Office Phone (661) 775-8770 Fax: (213) 244-8155
<mailto:wkoskie@semprautilities.com>

a. Based on the data response above to questions #5 and #14 above please provide the SoCalGas Root Cause analysis/investigation. See highlighted text that specifically states a root cause investigation and a root cause analysis will be conducted and provided to completely respond to questions #5 and #14.

Response 2:

SoCalGas has not conducted its own root cause analysis. Pursuant to a letter from the CPUC and DOGGR dated December 14, 2015 (http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/Letter%20dated%20December%2014%202015.pdf), SoCalGas was directed to retain an independent third party to perform the root cause analysis. In addition, pursuant to a CPUC letter dated February 11, 2016, SoCalGas was directed to turn over control of the SS-25 well site once SoCalGas had made the area safe after permanently sealing the well. SoCalGas was granted access on an as-needed basis in order to perform well pad conditioning and other work as necessary or required by DOGGR. Per CPUC investigation procedures, the CPUC released site control back to SoCalGas on September 12, 2018.

Question 3:

For this next question, please reference question #13 of attachment 1, an email data request from Maria C. Solis on 11/13/18. For convenience, the question states, "Estimate of the cost to mitigate the incident. I'll request this in the draft data request". Please provide a data response to question #13, a data response has not been provided to date specifically to respond to data request from 11/13/18.

Response 3:

SoCalGas objects to this request on the grounds that it assumes facts that do not exist with respect to the statement that "a data response has not been provided to date." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas provided a response to Maria Solis' data request dated November 13, 2015 on November 15, 2015. Subsequently, pursuant to the letter from the CPUC- Executive Director dated December 23, 2015 (http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/12-23-15%20Southern%20California%20Gas%20Shall%20Provide%20Information%20to%20CPUC%20Concerning%20Costs%20Associated.pdf), SoCalGas has provided monthly updates to the CPUC regarding the Aliso Incident costs. The most recent of these reports is provided in the enclosed electronic documents with Bates range AC_CPUC_SED_DR_30_0000001 - AC_CPUC_SED_DR_30_0000003 and provides the Aliso Incident costs recorded through October 31, 2018.

Question 4:

For this next set of questions, please refer to the incident reported in the following Los Angeles Daily News article https://www.dailynews.com/2015/10/29/gas-leak-near-porter- ranch-lingers-nearly-one-week-later/.

a. Please provide all records of this incident, including root cause analysis and mitigation.
b. If this is not the date of the specific incident, please provide actual date of the incident this article is referring to.

Response 4:

a. SoCalGas objects to this request as overly broad and vague and ambiguous as to "all records of this incident." Notwithstanding these objections, SoCalGas responds as follows: SoCalGas understands that CPUC-SED's inquiry is inquiring about and the article is referring to the SS25 incident at Aliso Canyon that began on October 23, 2015. See Responses 2 and 3. The root cause analysis associated with the October 23, 2015 incident is ongoing and is being performed by an independent third party.
b. See Response 4.a.

Question 5:

Please provide the resiliency plan and timeline of resiliency plan that was put in place when SoCalGas determined that the incident beginning October 23, 2015 required customer evacuations.

Response 5:

SoCalGas objects to this request as vague and ambiguous and assumes facts that do not exist regarding the use of the phrases "resiliency plan that was put in place." Notwithstanding these

objections, SoCalGas responds as follows: SoCalGas is not aware of a "resiliency plan" that relates to customer evacuations for the incident beginning October 23, 2015. Further, at no point in time did "SoCalGas determine[] that the incident beginning October 23, 2015 required customer evacuations." Additionally, no governmental agency or authority ordered an evacuation with respect to the incident. Accordingly, SoCalGas is not aware of any document or timeline relating to any "resiliency plan" requiring "customer evacuations."

SoCalGas instead interprets CPUC-SED's question to refer to the "SS-25 Incident Aliso Canyon Gas Leak Odorous Emissions Mitigation Plan and Temporary Relocation Plan" (the "Temporary Relocation Plan"). SoCalGas developed the Temporary Relocation Plan in consultation with various state and local government agencies in response to the Los Angeles County Department of Public Health's November 19, 2015 directive that SoCalGas "offer free, temporary relocation to any area residents affected by odors from the Aliso Canyon site." At no time were area residents required to relocate pursuant to the Temporary Relocation Plan; rather, residents were provided the option to relocate if they chose to do so.

For a copy of the Temporary Relocation Plan, dated December 15, 2015, that was adopted pursuant to a stipulation and Court Order dated December 24, 2015, please see electronic documents with Bates range AC_CPUC_SED_DR_30_0000004 - AC_CPUC_SED_DR_30_0000032.

Pursuant to the Department of Public Health's November 19, 2015 directive, SoCalGas offered free, temporary relocation to eligible residents from November 19, 2015 until approximately July 2016, when the last relocated residents returned home. The Temporary Relocation program ended by agreement between the County of Los Angeles and SoCalGas, and Court Order dated May 20, 2016.

Question 6:

Did SoCalGas have a resiliency plan in place immediately prior to the one provided in response to question 5? If so, please provide it.

Response 6:

As stated in Response 5, SoCalGas is not aware of a "resiliency plan" and interprets this question as referring to the Temporary Relocation Plan.

The Temporary Relocation Plan was not in place immediately prior to the incident, as it was developed in response to the incident.

Question 7:

Has SoCalGas's changed its company-wide resiliency plan since the one it created based upon the incident beginning October 23, 2015? If so, provide all such revised plans regardless of whether they are titled "resiliency" plan or something else.

Response 7:

As stated in Response 5, SoCalGas is not aware of a "resiliency plan" and interprets this question as referring to the Temporary Relocation Plan.

The Temporary Relocation Plan was developed in response to the incident and the directive from the Department of Public Health. The Plan itself has not been modified since the date it was adopted pursuant to the stipulation and Court Order dated December 24, 2015.

Question 8:

Please identify all changes made to the plans provided in response to questions 5, 6, and 7.

Response 8:

See Response 5.

SoCalGas made no changes to the Temporary Relocation Plan during the course of the incident. However, the practices for implementing the Temporary Relocation Plan were periodically revised and updated to address specific issues related to, among other things, eligibility, claims handling, and reimbursement processes.

Question 9:

Please provide all Incident Status Summary ICS forms 209 for daily operations from 10-23-15 to 2-28-16.

Response 9:

Please see electronic documents with Bates range AC_CPUC_SED_DR_30_0000033 - AC_CPUC_SED_DR_30_0000475.

Question 10:

Please submit any SoCalGas procedures, standard practices, or internal instructions that relate to cathodic protection standards for downhole well casings as applied to Aliso Canyon well casings, tubing, or other downhole equipment.

Response 10:

SoCalGas objects to this request as overbroad and vague and ambiguous as to the time period at issue and the phrase "procedures, standard practices, or internal instructions." Notwithstanding these objections, SoCalGas responds as follows: SoCalGas understands this request to be seeking written formal SoCalGas procedures related to cathodic protection for downhole well casings. Pursuant to SoCalGas' Storage Risk Management Plan, SoCalGas developed a storage-specific corrosion control manual to govern procedures, processes, and maintenance requirements

necessary to prevent and mitigate the occurrence of corrosion related wall loss on storage assets. SoCalGas previously provided its Storage Corrosion Control Manual to CPUC-SED on August 9, 2018 (see AC_CPUC_0206060 through AC_CPUC_0206113).

Question 11:

Were any of the procedures, standards, or instructions provided in response to question 10 performed on well SS-25?

a. If yes, please provide all records in relation to any cathodic protection used on well SS-25.
b. If not, please explain why not.

Response 11:

The Storage Corrosion Control Manual referenced in response to Question 10 was not performed on well SS25.

a. N/A.
b. The Storage Corrosion Control Manual was created after October 23, 2015.

Question 12:

Provide the well file for SS25 as it existed on October 23, 2015.

Response 12:

See Response 1.d.

Question 13:

Provide each iteration of the well file for SS 25 between and including October 23, 2015 and February 28, 2016. Be sure to include the date showing when each new iteration was created.

Response 13:

SoCalGas objects to "iteration of the well file" as vague and ambiguous. Notwithstanding this objection SoCalGas responds as follows: For purposes of this response, SoCalGas interprets the use of the term "well file" to mean the hard copy well files. The well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. Please note, electronic versions of various well file records are available in WellView and the UGS Server. In addition, there are other electronic databases (e.g., Maximo and OSI Soft PI) with well related information. SoCalGas does not track changes to its hard copy well files or electronic well file records. However, most records in the well files are dated, and records are added, not removed, from the well file. See Response 1.d.

Question 14:

Provide the excerpt of the change log that documents all changes to the SS25 well file between October 23, 2015 and February 28, 2016.

Response 14:

See Response 13.

Question 15:

Please provide all reasons for each change made to the well SS25 well file between October 23, 2015 and February 28, 2016.

Response 15:

See Response 13.

Question 16:

As of October 23, 2015, how many versions of the well SS25 well file were there at SoCalGas (please include the master copy of the well file in answering this question)?

a. Produce all such well files.
b. As of October 23, 2015, did all versions of the SS25 well files match one another?
c. If the answer to question 16a is anything other than an unqualified "yes", please list all discrepancies between the master SS25 well file and each of the others.
d. Did any versions of the SS25 well files exist between October 23, 2015 that SoCalGas cannot produce in response to this data request?
e. If the answer to question 16c is yes, how many?
f. If the answer to question 16c is yes, what happened to each file that SoCalGas cannot produce today?

Response 16:

SoCalGas objects to this request as vague and ambiguous as to the phrase "versions of the well SS25 well file" and "master copy of the well file." Notwithstanding this objection, SoCalGas responds as follows: For purposes of this response, SoCalGas interprets the use of the term "well file" to mean the hard copy well files. The well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. Please note, electronic versions of various well file records are available in WellView and the UGS Server.

As previously explained in SoCalGas' response to CPUC-SED Data Request 17, Question 19, on October 23, 2015, well files were kept at each respective storage facility. In addition, duplicate

copies of well files for all storage fields were warehoused at Aliso Canyon. These duplicate well files were not updated.

a. Please see Response 1.d. For the warehoused duplicate copy of the SS25 well file, please see electronic documents with Bates range AC_CPUC_SED_DR_30_0000476 - AC_CPUC_SED_DR_30_0001177.
b. The SS25 well file did not match the warehoused duplicate copy because the duplicate copy was not updated.
c. SoCalGas objects to this request as unduly burdensome. Notwithstanding this objection, SoCalGas responds as follows: See Response 16.a.
d. No.
e. N/A.
f. N/A.

Question 17:

Provide the change log or change logs showing changes to all SoCalGas well files. The change logs should include data entered at the date each log was created and include data that was included up through the date of this data request.

Response 17:

See Response 13.

Question 18:

Please refer to the attached email thread, dated November 4, 2015 including communications between Amy Kitson, Glenn La Fevers, Jimmie Cho and Avideh Razavi. For reference (see attached 3), the email thread states in part,

"Glenn and Jimmie-
Avi is available at noon to go through the SS 25 data with you."

a. Please explain in detail communications of this meeting.
b. Please provide all communications related to this meeting with regards to "SS 25 data".

Response 18:

a. See SoCalGas' response to CPUC-SED Data Request 32, Question 23.
b. Please see previously provided electronic documents with Bates range AC_CPUC_SED_KITSON_00010026 through AC_CPUC_SED_KITSON_00010027.

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED OCTOBER 12, 2018

SOCALGAS RESPONSE DATED NOVEMBER 7, 2018

SoCalGas provides the following responses to the California Public Utilities Commission–Safety and Enforcement Division's October 12, 2018 request for information. These responses are based upon the best available non-privileged information known at this time and are subject to change and/or supplementation as SoCalGas' investigation continues, and additional information becomes available.

SoCalGas submits these responses, while generally objecting to any request that fails to provide a defined time period to which SoCalGas may tailor its response, and to the extent that any request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these responses without conceding the relevance of the subject matter of any request or response. SoCalGas reserves the right to object to use of these responses, or information contained therein, in any dispute, matter or legal proceeding before any court, tribunal, or agency, or governmental action. Finally, at the time of this response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

Please refer to the document entitled, WellView Data Integrity Project, dated March 4, 2015 and answer the following questions about it.

Question 1:

Please confirm SED's understanding that the WellView Data Integrity Project worked on a repository called WellView, which kept digitized versions of certain well files and schematics dating back to 2001. If this is incorrect, please clarify:

a. The date WellView began keeping digitized versions of SoCalGas well files.
b. That WellView is a repository to keep digitized versions of SoCalGas well files.

Response 1:

In 1997, SoCalGas purchased the WellView software application and license in an effort to create an electronic database of ongoing drilling, abandonment, workover and rig-less activity data, and to develop electronic wellbore schematics.

SoCalGas understands that where SED uses the term "WellView Data Integrity Project," which was the terminology employed by SoCalGas' third-party vendor, it is referring to what SoCalGas refers to as the "WellView Data Entry Project" that was initiated by SoCalGas on or around March 30, 2015. The WellView Data Entry Project involved electronically capturing information contained in the well file and well file records in order to "digitize" historical drilling, abandonment, and workover information into WellView with the objective of

developing an electronic wellbore schematic. SoCalGas defines "digitize" in this context to mean extraction, collection and entry of data and information from historical records into an electronic database (as distinct from duplication of hard copy records in electronic format). Please note, this digitization was an iterative process and the primary source of the data that was digitized into WellView was the hard copy well files. Data that was digitized into WellView continues to remain in the hard copy well files and electronic well file records. Please note, WellView does not contain a set of well files. WellView is a well data management system containing certain digitized data and information from the hard copy well files and electronic well file records related to well planning, completion, testing and workovers.

The WellView Data Entry Project was one of SoCalGas' initial efforts in developing its Storage Integrity Management Program (SIMP). In addition to the WellView Data Entry Project, SoCalGas initiated several other SIMP projects during this timeframe, including but not limited to: (1) Draft SIMP Plan (the initial development of the written plan for SIMP which is a proactive program to assess and enhance the safety and integrity of our underground storage system.); (2) SIMP Pilot Program (the commencement of well integrity and management work related to SIMP with a pilot program in 2014); and (3) Installation of Wireless Pressure Transmitters (the installation of wireless pressure transmitters to continuously monitor and record all surface pressures).

a. SoCalGas interprets this request as seeking the date SoCalGas began digitizing its well files under the WellView Data Entry Project. The agreement between SoCalGas and Well Life Cycle Resources for the WellView Data Entry Project was executed on March 30, 2015. The scope of work was for Well Life Cycle Resources to perform data entry into WellView and provide WellView database support services.
b. See Response 1.

Question 2:

Other than WellView, list all repositories SoCalGas has used in order to keep digitized well files since 2001.

Response 2:

See Response 1 and "digitize" definition. The only database SoCalGas digitizes well file information into is WellView. The well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. Please note, there are other electronic databases (e.g., Maximo and OSI Soft PI) with digitized well related information that are not contained in the well file.

As of October 23, 2015, in addition to the hard copy well files, SoCalGas collected electronic well file records and/or well related information in the following digital repositories:

- WellView
- Rig View
- OSI Soft PI
- Maximo

- SAP
- UGS Servers
- SharePoint

WellView: A well data management system containing well file records related to well planning, drilling, completion, testing and workovers.

RigView: A rig and well project scheduling system for drilling, completions, workovers and testing.

OSI Soft PI: The repository for process information such as storage field injection and withdrawal rates, and well pressures.

Maximo: The maintenance management system for storage facilities. Inspection activities for the following well components are scheduled and recorded in Maximo:

- Wellhead valve
- Surface safety valve
- Surface-controlled subsurface safety valve

SAP: Invoice management system.

UGS Server: A storage server used to store, access, secure and manage digital data and files, including but not limited to, electronic versions of well file records and staff working files.

SharePoint: SharePoint is a web-based, collaborative platform that integrates with Microsoft Office, including but not limited to, staff working files.

Question 3:

If there is more than one repository to keep digitized well files:

a. Does each repository keep a distinct set of well files, or do some well files exist in more than one repository?
b. For what purpose is each repository (including WellView) used?
c. Has information been corrected in each of these repositories in a similar fashion to the WellView Data Integrity Project?
d. If the answer to question 3c is yes, please provide:
    i. The name of the project to correct each repository.
    ii. The date the project to correct each repository began.
    iii. The date the project to correct each repository will end.
    iv. The scope of work for each repository, including the document that shows the scope of work.

Response 3:

No, see Response 2. SoCalGas defines "digitize" in this context to mean historical data collection and entry into a database. The only repository SoCalGas digitizes well file

information into is WellView. The well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. Please note, there are other electronic repositories with well related information that are not contained in the well file (e.g., Maximo and OSI Soft PI).

a. No, see Response 2.
b. See Response 1.
c. N/A.
d. N/A.

Question 4:

Specific to Aliso Canyon, provide all deliverables, products and other committed items that Wellview vendors have contracted or otherwise agreed to give to SoCalGas as part of the Wellview scope of work to date.

Response 4:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SoCalGas interprets this request as seeking a list of deliverables and products that third-party vendors provided to SoCalGas related to the "WellView Data Entry Project." Therefore, this response does not include deliverables and products from third-party vendors related to other activities or projects (e.g., data entry into WellView for ongoing rig activities). In addition, although this request is specific to Aliso Canyon, these deliverables also applied to non-Aliso Canyon storage fields.

Well Life Cycle Resources

See Response 1 regarding SoCalGas' hiring of Well Life Cycle Resources for the WellView Data Entry Project. For Well Life Cycle Resources' scope of work, please see electronic documents with Bates range AC_CPUC_SED_DR_32_0000019 through AC_CPUC_SED_DR_32_0000031. Well Life Cycle Resources digitized well file information into WellView on or around May 2015 through May 2017. The overall deliverables of this project were WellView database population and WellView support and training services.
To meet their deliverables, Well Life Cycle Resources created the following:

- *Weekly Progress Reports*: Weekly progress reports to track vendor hours and progress on the project.
- *WellView Configuration Observations and Suggestion Summary:* As part of the database support, Well Life Cycle Resources conducted a review of existing database securities, libraries, and reports.
- *WellView Configuration Tracking Sheet*: A working document used to track the database configuration and enhancements progress.
- *Training Documents*: Customized training documents for users.
- *WellView 9 to WellView10 Data Model Mapping*: Mapping in preparation of a software upgrade to verify data fields were mapped to the appropriate tables in the upgraded software data model.

InterAct PMTI, Inc.
In May 2018, SoCalGas hired InterAct PMTI, Inc. for work related to the collection and entry of historical data into WellView. The scope of work included the "digitization" of historical drilling, abandonment, and workover information into WellView. Please see Response 1 for the "digitization" definition. InterAct PMTI, Inc. began digitizing well file information into WellView on or around May 2018. For InterAct PMTI's scope of work, please see electronic documents with Bates range AC_CPUC_SED_DR_32_0000001 through AC_CPUC_SED_DR_32_0000018. This is a continuing and evolving effort. The overall deliverable of this project is continued database population for several purposes, including but not limited to, the development of electronic wellbore schematics.

To meet their deliverable, InterAct PMTI, Inc. created the following:

- *WellView Cleanup Checklist Tracking Spreadsheet*: This is a working document used to verify the vendor is capturing data in WellView based on a set of identified data attributes.
- *Draft "How To" documents*: Outlines standardization steps on how the data should be captured in WellView.

Question 5:

Of those deliverables, products and other committed items, identify each one that Ms. Avideh Razavi reviewed and approved.

Response 5:

In March 2015, Avideh Razavi, in her capacity as Storage Field Engineer I, initiated the Well Data Entry Project and generally reviewed the Well Life Cycle Resources deliverables identified in Response 4. In addition, Ms. Razavi reviewed and approved invoices for Well Life Cycle Resources that were relevant to the Well View Data Entry Project.

Question 6:

If SoCalGas maintains that Ms. Razavi reviewed and approved a given deliverable, product or other committed item, provide the documentation that shows Ms. Razavi did so.

Response 6:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Please see enclosed electronic documents with Bates range AC_CPUC_SED_DR_32_0000032 through AC_CPUC_SED_DR_32_0000033.

Question 7:

If another SoCalGas employee reviewed and approved a given Wellview deliverable, product or other committed item, please identify:

a. Each such employee.
b. The Wellview deliverable(s), product(s), and other committed item(s) the identified employees reviewed and approved.
c. The dates of these reviews and approvals.

Response 7:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SoCalGas interprets this request as seeking a list of SoCalGas employees in Storage who reviewed and/or approved deliverables and products, including invoices, that Well Life Cycle Resources and InterAct PMTI, Inc. provided to SoCalGas related to the collection and entry of historical data into WellView.

a. Avideh Razavi and Carla Lynx generally reviewed the deliverables for Well Life Cycle Resources and InterAct PMTI, Inc., respectively. Avideh Razavi, Carla Lynx, Neil Navin, and Amy Kitson have reviewed and approved invoices for Well Life Cycle Resources. Carla Lynx has reviewed and approved invoices for InterAct PMTI, Inc.
b. See Response 7.a.
c. Please see enclosed electronic documents with Bates range AC_CPUC_SED_DR_32_0000032 through AC_CPUC_SED_DR_32_0000033.

Question 8:

Did Ms. Razavi or any other SoCalGas employee who reviewed and approved given Wellview deliverable(s), product(s), or other committed item(s) ever recommend any edits, changes, or comments for revising those items.

Response 8:

Yes.

Question 9:

If the answer to the prior question is yes, provide all documentation showing such edits, changes, and comments.

Response 9:

SoCalGas objects to this request as overly broad and unduly burdensome. SoCalGas provided comments to Well Life Cycle Resources and InterAct PMTI, Inc. in many different ways (e.g., in-person communications, meetings, conference calls, email, etc.). Well Life Cycle Resources and InterAct PMTI, Inc. would then incorporate SoCalGas comments directly into WellView when appropriate.

Question 10:

Who for SoCalGas reviewed invoices of the Wellview vendors and authorized payment?

Response 10:

See Response 7.

Question 11:

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Please refer to the following testimony under oath, September 25, 2018, pages 137-139 by Ms. Razavi with regards to the document marked by SoCalGas as AC_CPUC_SED_KITSON_0000708:

> Q Ms. Razavi, in terms of the errors that you identified in this exhibit with the date, where does this data come from?
>
> WITNESS RAZAVI: A The vendor who input the data into WellView.
>
> Q So you're saying the vendor made an input error?
>
> A Yes.
>
> Q And this whole email is about correcting an error that the vendor may have made. But then there's yet another error in the date?
>
> A Yes.
>
> Q And then was that looked at? Was that quality verified? Or is this the first time you became aware of those dates being off?
>
> A It's the first time I became aware of the inaccurate dates.
>
> Q Do you have a quality assurance concern with this vendor?
>
> A Yes. That's why we changed our approach.
>
> Q And what do you mean by that?
>
> A We are now using another vendor and QCing the data that is being inputted into our WellView.

Q When did that take place, the shifted to the new vendor?

WITNESS RAZAVI: A It was earlier this year.

Q And so this email is your email; correct?

A Yes.

Q And these documents were attached to your email when you sent it around?

A Yes.

Q And this is January 2016, and we're now in September 2018. And so only in the last few months it was discovered that the original vendor had data issues?

A No, actually. The Well Lifecycle Resources identified that the individuals who were working on these wells had -- they were let go. And for some time, we continued with this vendor with a new team to do the data input. And then, ultimately, we switched vendors from Well Lifecycle Resources to another vendor.

Q I noticed that you picked up these errors right away when you looked at the document. Did you not look at the document before you sent it around?

A I don't remember.

With this dialogue in mind, please answer the following follow-up questions: With regards to Ms. Razavi's statement:

> "The Well Lifecycle Resources identified that the individuals who were working on these wells had -- they were let go. And for some time, we continued with this vendor with a new team to do the data input. And then, ultimately, we switched vendors from Well Lifecycle Resources to another vendor."

a. Please confirm this is an accurate transcript of this portion of Ms. Razavi's testimony. If this is inaccurate, please correct it.
b. Please list the individuals identified by Well Lifecycle Resources who were let go.
c. Please list the start and end dates of work on the WellView Data Integrity Project of the individuals identified by Well Lifecycle Resources who were let go.
d. Please list the individuals on the new team to do the data input.
e. Please list the start and end dates of work of each individual on the new team on the WellView Data Integrity Project.
f. Were errors found in the data input by the new team?
g. If errors were found in the data input by the new team, please provide the date they were first found?
h. If errors were found in the data input by the new team, please provide documentation showing the date they were first found.

i. Please list the date SoCalGas switched vendors from Well Lifecyle Resources to another vendor.
j. Please list the reasons SoCalGas switched from WellView Data Integrity Project to another vendor.

Response 11:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

To clarify, based on Ms. Razavi's recollection and the excerpt of Ms. Razavi's transcript provided in Question 11, the error(s) identified during Ms. Razavi's testimony were on the work completion date(s) of the vendor deliverable submittals, not the actual data input into the WellView database. SoCalGas is providing this response with this clarification in mind:

SoCalGas responds to the following requests with regards to the following statement: "The Well Lifecycle Resources identified that the individuals who were working on these wells had -- they were let go. And for some time, we continued with this vendor with a new team to do the data input. And then, ultimately, we switched vendors from Well Lifecycle Resources to another vendor."

a. Notwithstanding the fact that Ms. Razavi has not reviewed the transcript of her examination under oath, and is relying on the excerpt provided above, SoCalGas responds as follows: Yes.
b. Joel Wheat and Israel Guerra.
c. Based on the review of the invoices, these employees began work on the project on or around May 2015 and ended work on the project on or around September 2016.
d. Ron Buchanan and Andy Shroble from Well Life Cycle Resources.
e. Based on the review of the invoices, these employees began work on the project on or around September 2016 and ended work on the project on or around May 2017.
f. To the best of SoCalGas' current knowledge, SoCalGas is not aware of data input errors found by the individuals on the new team (Ron Buchanan, Andy Shroble) from Well Life Cycle Resources.
g. N/A.
h. N/A.
i. SoCalGas continues to use Well Life Cycle Resources for an audit tool license and associated support services. SoCalGas signed an agreement with InterAct PMTI, Inc. for historical data entry into WellView on May 14, 2018.
j. SoCalGas assumes that "WellView Data Integrity Project" as used in this question was intended to mean "Well Life Cycle Resources." SoCalGas was looking for a local vendor that could work on-site and have continuous access to SoCalGas' hard copy well files, could meet in person with SoCalGas' employees frequently, and is familiar with California regulations. InterAct PMTI, Inc. met these needs and at the time was also helping develop updated wellbore diagrams and was already in the process of reviewing the well files. In addition, given the familiarity of InterAct PMTI, Inc. with SoCalGas' well files and wellbore diagrams, they were selected to review the data entered by Well

Life Cycle Resources into WellView for the purposes of developing an electronic wellbore diagram.

Question 12:

Prior to learning of errors, did SoCalGas use the data input from the Well Lifecycle Resources team who were let go for any purpose or purposes?

Response 12:

No, as explained in Response 11, based on Ms. Razavi's recollection, the error(s) identified during Ms. Razavi's testimony were on the work completion date(s) of the vendor deliverable submittals, not the actual data input into the database.

Question 13:

If so, what purpose or purposes?

Response 13:

N/A.

Question 14:

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With regards to Ms. Razavi's statement:

"A We are now using another vendor and QCing the data that is being inputted into our WellView."

a. Please provide the name of the vendor who is QCing the data that is being inputted into SoCalGas's WellView.
b. Please provide the contract or contracts SoCalGas has with the vendor who is QC-ing the data that is being inputted into SoCalGas's WellView.
c. Is the vendor who is QC-ing the data that is being inputted into SoCalGas's WellView checking the data input into Wellview by Well Lifecycle resources to see if it is traceable, verifiable, complete and accurate?
d. Has anyone checked the data that was input into WellView by Well Lifecycle resources to see if it is traceable, verifiable, complete and accurate?
e. Does SoCalGas have a means of telling which data was input into WellView was input by Well Lifecycle resources, and which data was input into Wellview by someone else?
f. If so, please provide the documentation showing how SoCalGas tells the difference between data entered into WellView by Well Lifecycle resources, and data entered into WellView by someone else?

Response 14:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

a. InterAct PMTI, Inc.
b. Please see enclosed electronic documents with Bates range AC_CPUC_SED_DR_32_0000001 through AC_CPUC_SED_DR_32_0000018.
c. SoCalGas objects to this request as vague and ambiguous. Absent agreed definitions, the terms 'traceable, verifiable, complete and accurate' are vague and open to interpretation. Notwithstanding this objection, SoCalGas responds as follows: Please see enclosed electronic documents with Bates range AC_CPUC_SED_DR_32_0000001 through AC_CPUC_SED_DR_32_0000018.
d. SoCalGas objects to this request as vague and ambiguous. Absent agreed definitions, the terms 'traceable, verifiable, complete and accurate' are vague and open to interpretation. Notwithstanding this objection, SoCalGas responds as follows: Please see enclosed electronic documents with Bates range AC_CPUC_SED_DR_32_0000001 through AC_CPUC_SED_DR_32_0000018.
e. When a field within a table in WellView is edited, the name of the person who last changed the information is listed.
f. SoCalGas objects to this request as overly broad and unduly burdensome. Notwithstanding that objection, SoCalGas responds as follows: Please see enclosed electronic example document with Bates range AC_CPUC_SED_DR_32_0000034.

Question 15:

Did Ms. Razavi review every product of Wellview provided to her by the vendor?

Response 15:

See Response 5.

Question 16:

Please again refer to the document marked AC_CPUC_SED_KITSON_0000708, including an email from Ms. Razavi dated January 15th.

a. It is SED's understanding from Ms. Razavi during an Examination Under Oath that "clean up" referenced in this email from her referred only to digitizing well files into WellView. Is that understanding accurate?
b. If SED's understanding in 16a is not accurate, please explain.
c. Please refer to the sentence in this email that states, "The purpose of this project is to enter missing and/or correct, pertinent well data in WellView." It is SED's understanding that she only recalls corrections to typos, but not other errors, that were corrected to well file data entered into WellView. Is this understanding accurate?
d. If SED's understanding in 16c is not accurate, please explain.

Response 16:

a. Yes.
b. N/A.
c. To clarify, no changes were made to the hard copy well files. Well Life Cycle Resources used the hard copy well files and well file records to enter historical data into WellView as explained in Response 1. Based on the excerpt of Ms. Razavi's EUO transcript in Question 11, at the time of Ms. Razavi's EUO she recalled corrections to typos, but not corrections to errors. Upon further review, additional corrections to the WellView database were made based on well file records.
d. See Response 16.c.

Question 17:

Given SED's understanding from Ms. Razavi that she only recalls corrections to typos, but not other errors, that were corrected to well file data entered into WellView, please provide the following:

a. A list showing all errors in hard copies of Well Files that were corrected before being entered into WellView.
b. A highlight or other indication of all errors that SoCalGas asserts are merely typos.
c. A different indication of errors that SoCalGas acknowledges are not typos.
d. A tally of typos prior to October 23, 2015.
e. A tally of typos on and after October 23, 2015.
f. A tally of non-typographical errors prior to October 23, 2015.
g. A tally of non-typographical errors on and after October 23, 2015.

Response 17:

SoCalGas objects to this request on the grounds that it assumes, without foundation, that there were errors in hard copy well files that were corrected in the course of the WellView Data Entry Project. This is not an accurate assumption. The purpose of the WellView Data Entry Project was to input well file information contained in the hard copy the well files into an electronic database. SoCalGas further notes that because SED has not provided the transcript from Ms. Razavi's EUO to SoCalGas, SoCalGas is unable to assess SED's basis for this question.

a.-g. For clarification, incorrect data or typos were identified and corrected in WellView. This was done by comparing the information in WellView against the original records from the hard copy well files and other sources. There were no corrections or other changes to records in the well files as part of the WellView Data Entry Project.

Question 18:

In native file format that allows columns to be sorted, please provide the log that tracks all changes made to data in WellView, including, but not limited to:

a. Date and time the change data was entered into wellview;

b. Time of when the data is inputted;
c. Who did the inputting;
d. Please add a column that identifies when a change was made in this log due to changes in field and well conditions (such as construction or maintenance), and when the change was made even when there were no changes to field and well conditions.

Response 18:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

SoCalGas objects to this request as overly broad and unduly burdensome. Notwithstanding that objection, SoCalGas responds as follows: Please see enclosed electronic example document with Bates range AC_CPUC_SED_DR_32_0000034.

Question 19:

Please explain the process by which SoCalGas checked the data inputs of Well Lifecycle Resources, and the other WellView vendors for accuracy.

a. Was this process comprehensive to ensure all data inputs were corrected?
b. Provide the documentation that shows this.

Response 19:

No, SoCalGas did not QC Well Life Cycle Resources or InterAct PMTI, Inc.'s digitization of historical data in WellView. Both vendors had their own internal QC processes. Today, SoCalGas utilizes an audit tool to ensure the database is populated with data attributes that are in the vendors' scope of work. These audits are a snapshot in time.

a. N/A
b. N/A

Question 20:

Please refer to the document entitled WellView data integrity project, dated March 4th, 2015.

a. Please identify any portions of this document that were not part of the scope of work that was implemented for the inputting of data into WellView.
b. Please correct the portions of this document to show the actual scope of work that was implemented for the inputting of data into WellView.
c. Please provide the document that shows the actual scope of work that was implemented for the inputting of data into WellView.

Response 20:

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

The document entitled WellView Data Integrity Project, dated March 4th 2015 reflects a write-up description of the process that Well Life Cycle Resources used to digitize

information into WellView. This document was provided to Ms. Razavi on January 14, 2016 and is separate and distinct from the contract with Well Life Cycle Resources that provides the actual scope of work for the WellView Data Entry Project. For Well Life Cycle Resources' scope of work, please see enclosed electronic document with Bates range AC_CPUC_SED_DR_32_0000019 through AC_CPUC_SED_DR_32_0000031.

Question 21:

Provide the well file for SS-25 as it existed between October, 2015 and February, 2016.

Response 21:

For purposes of this response, SoCalGas interprets the use of the term "well file" in the questions to mean the hard copy well files explained in Response 2. Please note, electronic well file records are also collected in WellView and the UGS Server.

SoCalGas scanned the hard copy well file for SS-25 on or around January 2016 and these files were provided to SED on February 5, 2016 and June 3, 2016 (AC_CPUC_0000023 – AC_CPUC_0000759; AC_CPUC_0012338 to AC_CPUC_12389).

Question 22:

Provide the change logs that show any physical and digital copies of the SS-25 well files from March of 2015 through Feb of 2016?

Response 22:

For purposes of this response, SoCalGas interprets the use of the term "well file" in the questions to mean the hard copy well files explained in Response 2. SoCalGas keeps its well files in hard copy and does not track changes to the well files. However, most records in the well files are dated, and records are added, not removed, from the well file. Please note, electronic versions of various well file records are available in WellView and the UGS Server. Changes to electronic well file records are not tracked.

Question 23:

For this next set of questions, please refer to the document marked by SoCalGas as AC_CPUC_SED_KITSON_0002985.

a. This document appears to be an email thread, dated November 4, 2015, including Avideh Razavi, Glenn La Fevers , Amy Kitson, and Jimmie Cho to discuss holding a meeting at "the office trailer at noon" to "go through the SS 25 data." Is this an accurate depiction of the email thread? If not please correct it.
b. Did the meeting occur discussed in the email thread occur?
c. What date was the meeting held?
d. What was the purpose of the 11/4 meeting?
e. Please identify who attended the 11/4 meeting.

f. Please identify all topics discussed at the 11/4 meeting?
g. What was discussed at the 11/4 meeting relating to SS-25?
h. What was discussed at the 11/4 meeting relating to the well file for SS-25?
i. What was discussed at the 11/4 meeting relating to prior well kill attempts on SS- 25?
j. What was discussed at the 11/4 meeting relating to future well kill attempts on SS-25?
k. What was discussed at the 11/4 meeting relating to SS-25A, SS-25B, their well files, or any other wells or well files?
l. What does the phrase "the SS 25 data" mean in this email?
m. Does "the SS 25 data" relate to the SS-25 well file? If so, how?
n. Does "the SS 25 data" relate to the Wellview project? If so, how?
o. Does "the SS 25 data" relate to any other document or project relevant to well records, well safety, SIMP, or preparations for SIMP? If so, how?
p. What did SCG plan to do with "the SS 25 data" at the 11/4 meeting?
q. Had any information gaps been identified in the well file for SS-25 or any record related to SS-25 prior to the 11/4 meeting?
r. If so, for each gap: when was it identified, what was the gap, and when was it rectified?
s. Were any information gaps identified in the well file for SS-25 or any record related to SS-25 during the 11/4 meeting?
t. If so, for each gap:
    i. When was it identified?
    ii. What was the gap?
    iii. How was it rectified?
    iv. When was it rectified?
    v. Was information containing the gap provided to anyone tasked with killing SS25?
        1. If so,
            i. When was it identified?
            ii. What was the gap?
            iii. How was it rectified?
            iv. When was it rectified?
            v. Was information containing the gap provided to anyone tasked with killing SS25?
                1. If so:
                a. Which information gaps?
                b. To Whom?
                c. When?

        vi. Provide documentation showing each of these things.
u. Were any information gaps identified in the well file for SS-25 or any record related to SS-25 after the 11/4 meeting?
v. If so, for each gap:
    i. When was it identified?
    ii. What was the gap?
    iii. How was it rectified?
    iv. When was it rectified?
    v. Was the information containing the gap provided to anyone tasked with killing SS25?

i. If so:
    1. Which information gasp?
    2. To Whom?
    3. When?

vi. Provide documentation showing each of these things.

w. Had any inaccuracies been identified in the well file for SS-25 or any record related to SS-25 prior to the 11/4 meeting?

x. If so, for each inaccuracy:
    i. When was it identified?
    ii. What was the inaccuracy
    iii. How was it identified?
    iv. When was it rectified?
    v. Was the inaccurate information provided to anyone tasked with killing SS25?
    vi. If so:
        1. Which pieces of inaccurate information was provided?
        2. To whom?
        3. When?

y. Were any inaccuracies identified in the well file for SS-25 or any record related to SS-25 during the 11/4 meeting?

z. If so, for each gap:
    i. What was the inaccuracy?
    ii. When was it identified?
    iii. How was it rectified?
    iv. When was it rectified?
    v. Was the inaccurate information provided to anyone tasked with killing SS25?
    vi. If so:
        1. Which pieces of inaccurate information was provided?
        2. To Whom?
        3. When?

vii. Provide documentation showing each of these things?

aa. Were any inaccuracies identified in the well file for SS-25 or any record related to SS-25 after the 11/4 meeting?

bb. If so, for each inaccuracy:
    i. What was the inaccuracy?
    ii. When was it identified?
    iii. When was it rectified?
    iv. How was it rectified?
    v. Was the inaccurate information provided to anyone tasked with killing SS25?
    vi. If so:
        1. Which pieces of inaccurate information was provided?
        2. To Whom?
        3. When?

vii. Provide documentation showing each of these things.

viii.

cc. What did SCG plan to do with the SS-25 well file, and/or "the SS-25 data" pursuant to the 11/4 meeting?

dd. Did SCG or any of its employees or agents have any concerns related to using any SS-25 well file and/or "the SS-25 data" as it existed on Oct. 23, 2015?
   i. If so:
      1. Which employees and agents identified the concerns?
      2. Provide all communications showing these concerns.
      3. What were these concerns, and what were they based on?
      4. How and when were these concerns rectified?

ee. Did SCG or any of its employees or agents have any concerns related to using any SS-25 well file and/or "the SS-25 data" as it existed on Nov. 3, 2015?
   1. Which employees and agents identified the concerns?
   2. Provide all communications showing these concerns.
   3. What were these concerns, and what were they based on?
   4. How and when were these concerns rectified?

ff. Did SCG or any of its employees or agents make changes to any SS-25 well file, record, or data between Oct. 23, 2015 and February 11, 2016?
   i. If so, what change was made, and why?
   ii. Provide a list showing all such changes:
      1.Include dates of each change.
      2.Include those who made each change.
      3.Include reasons for each change.

gg. At any point between Oct. 23, 2015 and Feb. 18, 2016, did any Boots & Coots personnel request from any employee or agent of SCG any information related to SS-25 that the well file on SS-25 did not contain?

hh. If so, for each request:
   1. What information was requested?
   2. When was that information first requested?
   3. When was the unavailability of this information rectified?
   4. When did Boots & Coots receive this information?

ii. At any point between Oct. 23, 2015 and Feb. 18, 2016, did any Boots & Coots personnel request from any employee or agent of SCG any information related to SS-25 that the well file on SS-25 contained as inaccurate information?

jj. Was all of the information provided to Boots & Coots between October 23, 2015 and February 18, 2016 related to their well kill attempts checked for accuracy?
   i. If so:
   1. Please provide documentation showing this.
   2. Please provide the dates that such information was checked for accuracy.

kk. Provide a list showing the sources of information related to SS-25 provided to Boots & Coots between October 23, 2015 and February 18, 2016. Such information should include, but not be limited to such things as:
   i. Well history file for SS25 in hard copy.
   ii. Well history file for SS25 as shown in WellView.
   iii. Well history file for SS25 as shown in other digitized repositories.
   iv. Information gathered from DOGGR's website.
   v. Copy each of these sources of information and provide them in a folder entitled, "Information Related to SS25 Provided to Boots & Coots on SS25 October 23, 2015 to February 18, 2016".

ll. What was the purpose of the meeting later that day, referenced in the email subject as "Tonight's Meeting?"

mm. Please identify the people in attendance at the meeting referenced in the email subject as "Tonight's Meeting."

nn. Using "SS25", "SS-25", and all other possible iterations of that term, please search for all communications, including but not necessarily limited to emails related to the well file of SS-25 between October 2015 and November 2016.

   a. Please list all search terms used in the search.
   b. Please provide all communications found as a result of the search.

Response 23:

Based on a review of available documents and discussions with the individuals on the November 4, 2015 email, SoCalGas responds as follows:

a. AC_CPUC_SED_KITSON_0002985 is an email on November 4, 2015, between Amy Kitson, Glenn La Fevers, Jimmie Cho, and Avideh Razavi, regarding Ms. Razavi's availability to go through SS25 data with Mr. La Fevers and Mr. Cho.
b. Yes.
c. November 4, 2015.
d. To review SS25 data.
e. Avideh Razavi, Jimmie Cho, and Glenn La Fevers.
f. Based on a review of available documents and discussions with individuals on the November 4, 2015 email, it is SoCalGas' understanding that the topic that was discussed at the November 4, 2015 meeting was the development of talking points related to Aliso Canyon and SS25 well information.
g. Historical well information.
h. The meeting was not to discuss the well file, but rather to discuss SS25 historical well information, which includes information contained in the SS25 well file.
i. Based on a review of available documents and discussions with individuals on the November 4, 2015 email, it is SoCalGas' understanding that prior well kill attempts on SS25 were not discussed at the November 4, 2015 meeting.
j. Based on a review of available documents and discussions with individuals on the November 4, 2015 email, it is SoCalGas' understanding that prior well kill attempts on SS25 were not discussed at the November 4, 2015 meeting.
k. Aliso Canyon and SS25 well information. See Response 23.f. and 23.h.
l. Historical information about the well SS25. See Response 23.h.
m. The historical well information is contained in the SS25 well file.
n. No.
o. No.
p. The purpose of discussing the SS25 historical well information was to create talking points in order to prepare for external meetings scheduled for November 4, 2015.
q. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: The November 4, 2015

meeting did not involve discussion of potential gaps in the well file. Based on the recollection of the individuals that attended the meeting, they were not aware of any gaps in the well file prior to that meeting.

r. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: N/A.

s. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: No.

t. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: N/A

u. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: No.

v. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: N/A.

w. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: No.

x. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: N/A.

y. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: No.

z. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: N/A.

aa. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: No.

bb. SoCalGas objects to this request as overly broad and unduly burdensome with respect to "any record related to SS-25" and vague and ambiguous with respect to "information gap." Notwithstanding these objections, SoCalGas responds as follows: N/A.

cc. See Response 23.p.

dd. SoCalGas objects to this request as vague and ambiguous with respect to "any concerns." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas is not aware of any of its employees or agents having concerns related to using the SS-25 well file and/or "the SS-25 data" as it existed on October 23, 2015.

ee. SoCalGas objects to this request as vague and ambiguous with respect to "any concerns." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas is not aware of any of its employees or agents having concerns related to using the SS-25 well file and/or "the SS-25 data" as it existed on November 3, 2015.

ff. SoCalGas keeps its well files in hard copy and does not track changes to the well files. However, most records in the well files are dated, and records are added, not removed, from the well file. Please note, electronic well file records are contained in WellView and the UGS Server.

gg. SoCalGas objects to this request as vague and ambiguous and overbroad with respect to "any information related to SS-25 that the well file on SS-25 did not contain." Notwithstanding this objection, SoCalGas responds as follows: SoCalGas provided the well file and additional well related information for SS25 requested by Boots and Coots. See also Response 23.hh below.

hh. SoCalGas has provided communications between Boots and Coots and SoCalGas that include requests related to the SS25 incident. Please see previously provided Bates range AC_CPUC_SED_DR_16_0001037 – AC_CPUC_SED_DR_16_0019407.

ii. SoCalGas objects to this request as vague and ambiguous. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas is not aware of any Boots & Coots personnel request for information related to SS-25 that the well file on SS-25 contained as inaccurate.

jj. SoCalGas objects to this request as vague with respect to the phrase "all of the information provided" and time period at issue, and as overly broad. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas did not verify whether the information provided to Boots and Coots between October 23, 2015 and February 18, 2016 was accurate after it was provided to Boots & Coots. SoCalGas has no reason to believe that any information provided to Boots & Coots during that period was not accurate.

kk. SoCalGas has provided communications between Boots and Coots and SoCalGas that include data requests related to the SS25 incident. Please see previously provided Boots & Coots communications with Bates range AC_CPUC_SED_DR_16_0001037 – AC_CPUC_SED_DR_16_0019407. Please note Boots and Coots was provided the hard copy well file for SS-25. SoCalGas scanned the hard copy well file for SS-25 on or around January 2016 and these files were provided to SED on February 5, 2016 and June 3, 2016 (AC_CPUC_0000023-AC_CPUC_0000759; AC_CPUC_0012338 to AC_CPUC_12389).

ll. Based on a review of available documents and discussions with individuals on the November 4, 2015 email, it is SoCalGas' understanding that it participated in two meetings on the evening of November 4, 2015. SoCalGas held a briefing with various governmental agencies and also attended a meeting of the Porter Ranch Neighborhood Council.

mm. Based on a review of available documents and discussions with individuals on the November 4, 2015 email, it is SoCalGas' understanding that its briefing with governmental agencies was attended by representatives of various agencies, including the Los Angeles City and County Fire Departments, the South Coast Air Quality Management District, the Division of Oil Gas and Geothermal Resources, the Los Angeles County Department of Health and elected officials. SoCalGas does not have a list of attendees at the Porter Ranch Neighborhood Council meeting.

nn. SoCalGas objects to this request as overly broad and unduly burdensome.

Question 24:

As stated in the instructions, please provide the name of the person responsible for answering each question in this data request.

Response 24:

SoCalGas objects to the instructions submitted by SED on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature are expressly prohibited by California Code of Civil Procedure Section 2030.060(d). Notwithstanding this objection, responses to Q1 through Q23 were generally prepared and reviewed by Avideh Razavi and Gregory Healy.

Question 25:

For every question in this data request, please clarify whether SoCalGas asserts that the information in the answer and in the question be kept confidential. If SoCalGas asserts the information in the question be kept confidential, please provide each legal basis for doing so.

Response 25:

Please see the Confidentiality Declaration which has been provided in association with SoCalGas' responses to this data request.

SOUTHERN CALIFORNIA GAS COMPANY

CPUC-SAFETY AND ENFORCEMENT DIVISION AND DEPARTMENT OF CONSERVATION- DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES DATED JANUARY 26, 2016

Supplemental Response Dated March 11, 2019

General Response:

The information provided herein and in the enclosed electronic document production is provided in response to the January 26, 2016 data requests of the CPUC-SED and DOGGR. The information provided is based upon the best available information known at this time. SoCalGas reserves the right to supplement, amend, or correct the responses to the extent it discovers additional responsive information. Please note that this is a partial production, which supplements the initial productions in response to Questions A.1 and C.1 on February 5, 2016 and June 3, 2016.

The supplemental responses provided herein are denoted in red.

A. Detailed Well Data – "Standard Sesnon" 25 (SS-25) (API 037-00776)

Question 1:

All well records.

Response 1 (February 5, 2019):

Please see enclosed electronic document production set for copies of documents comprising the active SS-25 well file, documents Bates range AC_CPUC_0000023 - AC_CPUC_0000759.

Supplemental Response 1 (June 3, 2016):

SoCalGas has identified additional documents related to Standard Sesnon 25 and supplements its responses to Question A(1) of SED and DOGGR's data request dated January 26, 2016, and to Question 1 of SED's data request dated March 10, 2106, to include these documents. This supplemental production is bates stamped AC_CPUC_0012338 to AC_CPUC_12389 and is a copy of a file labeled Standard Sesnon Well #1-25 as it was kept in the usual course of business. For purposes of clarity, we identify below the documents that have not been previously produced to SED:

AC_CPUC_0012338

AC_CPUC_0012351

AC_CPUC_0012352

AC_CPUC_0012353

AC_CPUC_0012354

AC_CPUC_0012355

AC_CPUC_0012357

AC_CPUC_0012358

AC_CPUC_0012361

AC_CPUC_0012386

AC_CPUC_0012388

AC_CPUC_0012389

Supplemental Response 1 (March 11, 2019):

Please see enclosed electronic document production with the Bates range AC_CPUC_0206158 - AC_CPUC_0208846.

The enclosed documents supplement the complete hard copy version of the well file for SS-25, originally produced on February 5, 2016, and include electronic well file documents and/or well-related information to further assist the CPUC and DOGGR's investigation with a comprehensive, broad set of well-related information. While SoCalGas continues to keep its well files in hard copy, electronic versions of well file records are available in various digital repositories (e.g., WellView, UGS Servers). The hard copy well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. The only repository SoCalGas digitizes well file information is WellView.

Please note that SoCalGas had previously supplemented its production of the well file for SS-25 on June 3, 2016. The June 3, 2016 supplemental production was Bates stamped AC_CPUC_0012338 – AC_BLD_0012389.

C. Construction - SS-25, S-25A, SS-25B

Question 1:

For well sites SS-25, S-25A, SS-25B, provide any and all design and construction records for since well inception.

Response 1 (February 5, 2016):

As to well SS-25, see response to A1.

As to well SS-25A, please see enclosed electronic document production set for the active well file associated with well SS-25A, Bates range AC_CPUC_0000001 - AC_CPUC_00000011 and AC_CPUC_0000760 - AC_CPUC_0001198.

As to well SS-25B, please see enclosed electronic document production set for the active well file associated with well SS-25B, Bates range AC_CPUC_0000012 - AC_CPUC_0000022 and AC_CPUC_0001199 - AC_CPUC_0001587.

Supplemental Response (March 11, 2019):

Please see enclosed electronic documents with the Bates range AC_CPUC_0208847 - AC_CPUC_0212127 for SS-25A and AC_CPUC_0212128 - AC_CPUC_0213917 for SS-25B.

The enclosed documents supplement the complete hard copy version of the well file for SS-25A and SS-25B, originally produced on February 5, 2016, and include electronic well file documents and/or well-related information to further assist the CPUC and DOGGR's investigation with a comprehensive, broad set of well-related information. While SoCalGas continues to keep its well files in hard copy, electronic versions of well file records are available in various digital repositories (e.g., WellView, UGS Servers). The hard copy well file consists of the following: (1) histories (2) logs, (3) surveys, and (4) invoices. The only repository SoCalGas digitizes well file information is WellView.

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
UPDATED DATA REQUEST DATED OCTOBER 17, 2016

RESPONSE DATED NOVEMBER 7, 2016

SoCalGas provides the following response to the California Public Utilities Commission–Safety and Enforcement Division's October 10, 2016 request for supplemental information. This response is based upon the best available non-privileged information known at this time, and is subject to change and/or supplementation as SoCalGas' investigation continues, and additional information becomes available.

Question 1:

(Active) Well List (injection/withdrawal list, deliverability list) - **provide records for all Aliso Field, years 1990 - 2016**

Response 1:

For withdrawal schedules from 1995 through 2016, please see enclosed the electronic documents with Bates Range AC_CPUC_0013630-AC_CPUC_0014120.

For injection schedules from 1990 through 2016, please see enclosed the electronic documents with Bates Range AC_CPUC_00 – AC_CPUC_0014121-AC_CPUC_0014298.

Question 3:

Daily Drilling (Workover) Reports(typically provided by well contractors for SoCalGas field engineers to summarize in DOG "History of Oil or Gas Well") – **provide records for SS-25, SS-25A. SS-25B, years 1968-2016**

Response 3:

SoCalGas previously provided the well files for SS-25, SS-25A, and SS-25B on February 5, 2016 and June 3, 2016. These well files include daily operations summaries for SS-25, SS-25A, and SS-25B.

- For the SS-25 well file, please see the documents with Bates Range AC_CPUC_0000023 – AC_CPUC_0000759 and AC_CPUC_0012338-AC_CPUC_0012389.
- For the SS-25A well file, please see the documents with Bates Range AC_CPUC_0000001 – AC_CPUC_00000011 and AC_CPUC_0000760 – AC_CPUC_0001198.
- For the SS-25B well file, please see the documents with Bates Range AC_CPUC_0000012 – AC_CPUC_0000022 and AC_CPUC_0001199-AC_CPUC_0001587 – AC_CPUC_0001198.

For additional SS-25, SS-25A, and SS-25B daily operations summaries, please see the enclosed documents with Bates Range AC_CPUC_
0014299-AC_CPUC_0014562.

Question 8:

Data Base of all Aliso Storage Wells requiring noise logs– what wells had FU noise logs - **provided records for all Aliso Field, 2000 – 2016**

a. This data may be provided in a easily sortable spreadsheet form. A duplicate *.pdf of the same information may be sent in conjunction for records control purposes.

Response 8:

For a list of noise logs from 2010 through 2015, please see enclosed the document Bates stamped AC_CPUC_0014711.

Question 9:

Annual SoCalGas - Storage Field Reports **– provide records for years 2000 – 2016**

Response 9:

For Annual Field Reports from 2007-2014, please see enclosed the documents with Bates Range AC_CPUC_0014563- AC_CPUC_14668.

Question 11:

(Pre-SIMP/SIMP)Well list and Verner USIT logs run on each **– provide records for years 2010 – 2016**

Response 11:

For SIMP well lists, please see enclosed the documents with Bates Range AC_CPUC_0014669-AC_CPUC_0014710.

SOUTHERN CALIFORNIA GAS COMPANY

CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST 17
DATED MARCH 30, 2018

RESPONSE DATED APRIL 27, 2018

SoCalGas provides the following response to the California Public Utilities Commission–Safety and Enforcement Division's March 30, 2018 request for information. This response is based upon the best available non-privileged information known at this time, and is subject to change and/or supplementation as SoCalGas' investigation continues, and additional information becomes available.

Question 17:

As of October 23, 2015, please identify all other terms SoCalGas used to describe the repository of information SoCalGas collects with regards to each of their wells at their natural gas storage facilities. If any of these terms identify well related documentation that is not kept in the well file, please provide the working definition of each such term, and include what information is kept that is not kept in the well file.

Response 17:

SoCalGas objects to this request as vague and ambiguous. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas interprets this request as seeking information regarding digital repositories of well related information other than the well file.

On October 23, 2015, in addition to the well files, SoCalGas collected electronic well file records and well related information in the following digital repositories:

- WellView
- Rig View
- OSI Soft PI
- Maximo
- SAP
- UGS Servers
- SharePoint

WellView: A well information management system containing well file records related to well planning, drilling, completion, testing and workovers.

RigView: A rig and well project scheduling system for drilling, completions, workovers and testing.

OSI Soft PI: The repository for process information such as storage field injection and withdrawal rates, and well pressures.

Maximo: The maintenance management system for storage facilities. Inspection activities for the following well components are scheduled and recorded in Maximo:

- Wellhead valve
- Surface safety valve
- Surface-controlled subsurface safety valve

SAP: Invoice management system.

UGS Server: A storage server used to store, access, secure and manage digital data and files, including but not limited to, electronic versions of well file records and staff working files.

SharePoint: SharePoint is a web-based, collaborative platform that integrates with Microsoft Office, including but not limited to, staff working files.

Question 18:

As of the date of this data request, please identify all other terms SoCalGas uses to describe the repository of information SoCalGas collects with regards to each of their wells at their natural gas storage facilities. If any of these terms identify well related documentation that is not kept in the well file, please provide the working definition of each such term, and include what information is kept that is not kept in the well file.

Response 18:

SoCalGas objects to this request as vague and ambiguous. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas interprets this request as seeking information regarding digital repositories of well related information other than the well file.

As of the date of this request, in addition to the well files, SoCalGas collects electronic well file records and well related information in the following digital repositories described in Response 17:

- WellView
- Rig View
- OSI Soft PI
- Maximo
- SAP
- UGS Servers
- SharePoint

Question 19:

Please list all locations where SoCalGas kept its well files for the following storage facilities on October 23, 2015:
Aliso Canyon?
Honor Rancho?
Goleta?

Response 19:

On October 23, 2015, well files were kept at each respective storage facility. In addition, duplicate copies of well files for the above referenced storage fields were warehoused at Aliso Canyon. These duplicate well files were not updated.

Question 20:

Please list all locations where SoCalGas keeps its well files for the following storage facilities as of the date of this data request:
-Aliso Canyon?
-Honor Rancho?
-Goleta?

Response 20:

As of the date of this data request, well files are kept at each respective storage facility. In addition, duplicate copies of well files for the above referenced storage fields are warehoused at Aliso Canyon. These duplicate well files are not updated.

Question 21:

On October 23, 2015, did SoCalGas keep its well files in hard copy, electronically, or both?

Response 21:

On October 23, 2015, SoCalGas kept well files in hard copy. Electronic versions of various well file records were available in the digital repositories listed in Response 17.

Question 22:

Today, does SoCalGas keep its well files in hard copy, electronically, or both?

Response 22:

Today, SoCalGas keeps well files in hard copy. Electronic versions of various well file records are available in the digital repositories listed in Response 18.

Question 23:

If SoCalGas keeps any well files electronically, please describe the process SoCalGas used to ensure that the information in the electronic well file is a complete and accurate match of any well file related hard copy information.

Response 23:

See Response 22.

Question 24:

Does SoCalGas track changes to its well files? If so, describe the method SoCalGas uses to track such changes?

Response 24:

No, SoCalGas does not track changes to its well files. However, most well file records are dated, and records are added not removed from the well files. SoCalGas is currently working on transitioning UGS Records to an electronic Records Document Management System that will be able to track well file changes.

Question 25:

Does SoCalGas have an index or other such documentation that shows its well files? If so, please provide it.

Response 25:

SoCalGas objects to this request as vague and ambiguous. Notwithstanding this objection, SoCalGas responds as follows: No, SoCalGas does not have an index of the contents of each well file.

Question 26:

If the answer to question 25 is yes, did SoCalGas have such an index or documentation on October 23, 2015? If so, please provide that documentation as it existed on October 23, 2015?

Response 26:

N/A.

Question 27:

With regards to the well file or well files for SS-25 on October 23, 2015?

a. Was there more than one well file?
b. If so, how many were there?
c. Were there multiple copies of the well file for SS-25? If so, how many copies of the well file for SS-25 were there?
d. Was control kept over each copy? In other words, if there were more than one copy of the SS- 25 well file prior to October 23, 2015, when information was added to or changed in one copy, was it added to or changed in the same way in all of the other copies?
e. Describe the organizational structure, if any, in which the SS-25 well file(s) were arranged. For example, were the grouped with other well files in any fashion? If so, for what purpose were they organized the way they were?
f. Please identify all of the repositories in which the well file(s) for SS-25 was kept.

Response 27:

a. No, wells have one well file with multiple parts.
b. N/A.
c. See Response 19.
d. See Response 19.
e. The SS-25 well file was kept with the other well files.
f. See Response 21.

Question 28:

Please answer the same questions as in question 24, but do so for the well file(s) and copies of such well file(s) related to SS-25A.

Response 28:

a. No, wells have one well file with multiple parts.
b. N/A.
c. See Response 19.
d. See Response 19.
e. The SS-25A well file was kept with the other well files.
f. See Response 21.

Question 34:

How does SoCalGas document work at Aliso Canyon in general?

Response 34:

In general, SoCalGas documents well work electronically. Documentation of work performed on a well is also retained in well files, as appropriate.

Question 35:

Where does SoCalGas keep documentation about work done at Aliso Canyon?

Response 35:

SoCalGas documents valve maintenance and inspection activities in Maximo and wellwork activities in WellView. Documentation of work performed on a well is also retained in well files, as appropriate.

Question 36:

In what form does SoCalGas keep documentation about work done at Aliso Canyon?

Response 36:

The documentation stored for work done at our storage fields is stored in digital format. Documentation of work performed on a well is also retained in well files, as appropriate.

Question 37:

List all types of historical documents does SoCalGas keep at Aliso Canyon?

Response 37:

SoCalGas stores and maintains the following well-related historical types of documents at Aliso Canyon:

- Well design, drilling, maintenance, and abandonment records
- Inspection records (logs, surveys, tests)
- Operational data and reports
- Maps
- Diagrams
- Geological and reservoir studies and reports
- New drilling, maintenance/remediation, and abandonment

SOUTHERN CALIFORNIA GAS COMPANY

CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST 17
DATED MARCH 30, 2018

RESPONSE DATED MAY 11, 2018

SoCalGas provides the following response to the California Public Utilities Commission–Safety and Enforcement Division's March 30, 2018 request for information. This response is based upon the best available non-privileged information known at this time, and is subject to change and/or supplementation as SoCalGas' investigation continues, and additional information becomes available.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding before any court, tribunal, agency or governmental action. Finally, at the time of this Response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

Question 15:

Please provide SoCalGas's working definition of the term "well file" used on October 23, 2015.

Response 15:

On October 23, 2015 SoCalGas' working definition of the "well file" included records relating to well design, historical testing, workover, and other information pertinent to the operation of an underground storage well.

Question 16:

Please provide SoCalGas's working definition of the term "well file" used as of the date of this data request.

Response 16:

Today, SoCalGas' working definition of the "well file" includes records relating to well design, historical testing, workover, and other information pertinent to the operation of an underground storage well.

Question 32:

Please define casing failure.

Response 32:

SoCalGas defines "casing failure" as casing leaks or breaches in the casing.

Question 33:

Please provide all documents from Aliso Canyon related to casing failures. This request applies to Aliso Canyon well work. The information is as of October 23, 2015.

Response 33:

Based on a meet and confer discussion regarding this data request, SoCalGas provided a table previously produced on January 17, 2017 identifying past casing leaks. SoCalGas understands that the prior production on January 17, 2017 satisfies this request. SoCalGas can provide additional documentation if further information is required and requested by SED.

For the previously produced table and associated workover histories identifying casing leaks at the Aliso Canyon Storage Field, the type of leak, the well depth location, and the method of mitigation and repair, please see enclosed electronic documents with Bates range: AC_CPUC_SED_DR_17_0001077 through AC_CPUC_SED_DR_17_0001449.

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED AUGUST 21, 2018

SOCALGAS RESPONSE DATED OCTOBER 5, 2018

SoCalGas provides the following responses to the California Public Utilities Commission–Safety and Enforcement Division's August 21, 2018 request for information. These responses are based upon the best available non-privileged information known at this time and are subject to change and/or supplementation as SoCalGas' investigation continues, and additional information becomes available.

SoCalGas submits these responses, while generally objecting to any request that fails to provide a defined time period to which SoCalGas may tailor its response, and to the extent that any request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these responses without conceding the relevance of the subject matter of any request or response. SoCalGas reserves the right to object to use of these responses, or information contained therein, in any dispute, matter or legal proceeding before any court, action. Finally, at the time of this response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

Question 1:

Please identify all of the various maximum pressures that apply to Southern California Gas Company natural gas storage facilities and/or wells. This should include, but not be limited to:

a. Design pressure
b. Maximum shut in tubing pressure
c. Reservoir pressure

Response 1:

SoCalGas interprets this request as seeking the following maximum pressures that apply to belowground gas storage infrastructure and/or wells at SoCalGas' current natural gas storage fields – Aliso Canyon, Honor Rancho, Playa del Rey, and La Goleta. Please note, other than wellhead pressure information, the response does not include pressure information for the above-ground facilities at SoCalGas' natural gas storage fields.

a. Design Pressure: Gas storage wells are connected to the gas storage reservoir. As a result, each well operates under the same "maximum reservoir pressure." SoCalGas designs new casing and tubing strings for wells in accordance with American Petroleum Institute (API) Technical Report 5C3 and utilizes a minimum safety factor of 1.15 for internal yield pressure for new casing and tubing. Gas storage wellheads are designed with pressure ratings based on the maximum operating pressure of a well.
b. Maximum Shut-In Tubing Pressure: The maximum shut-in tubing pressure for the SoCalGas storage fields, are as follow:
    i. Aliso Canyon – 3050 psi. Please note, this maximum surface pressure is based on the original maximum reservoir pressure of 3600 psi. The current maximum

reservoir pressure of 2,926 psi corresponds to a maximum surface pressure of 2,476 psi.

ii. Honor Rancho – 3600 psi.
iii. Playa del Rey –1491 psi.
iv. La Goleta – 1861 psi.

c. Reservoir Pressure: The maximum reservoir pressure for the SoCalGas storage fields are as follows:
   i. Aliso Canyon – 3600 psi. Please note, this maximum reservoir pressure is the original maximum reservoir pressure for the Aliso Canyon storage field. The current maximum reservoir pressure per DOGGR is 2,926 psi.
   ii. Honor Rancho – 4400 psi.
   iii. Playa del Rey – 1700 psi.
   iv. La Goleta – 2050 psi.

Question 2:

Please provide the formulas SoCalGas uses to determine each of the pressures provided in response to question 1.

Response 2:

a. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000001 - AC_CPUC_SED_DR_27_0000022.
b. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000023 - AC_CPUC_SED_DR_27_0000045.
c. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000046 - AC_CPUC_SED_DR_27_0000064.

Question 3:

Please list all SoCalGas Company documents that talk about or reference the pressures referenced in question 1, and the formulas provided in response to question 2 with regards to SoCalGas natural gas storage facility wells. These documents should include, but not be limited to, requirements, standards, practices, programs, and anything else that sets for instructions or requirements for determining these maximum pressures on SoCalGas natural gas storage facility wells.

Response 3:

SoCalGas interprets this request as seeking SoCalGas' current written requirements, standards, programs, and procedures that set forth the instructions or requirements for determining the maximum pressures provided in Response 1 and the formulas provided in Response 2. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000001 - AC_CPUC_SED_DR_27_0000064.

Question 4:

Please provide the terms Southern California Gas Company uses that relate to:

a. The limits on reservoir pressure at a Southern California Gas Company natural gas storage facility?
b. The reservoir pressure beyond which a Southern California Gas Company natural gas storage facility reservoir should not operate?
c. The design pressure at a Southern California natural gas storage facility well.
d. The Maximum shut in tubing pressure at a Southern California natural gas storage facility well.

Response 4:

a. Minimum Reservoir Pressure and Maximum Reservoir Pressure.
b. Maximum Reservoir Pressure.
c. Please see Response 1.a.
d. Maximum Surface Pressure.

Question 5:

Please provide all Southern California Gas Company documents that talk about or reference to the terms SoCalGas has provided in response to question 4. These documents should include, but not be limited to requirements, standards, practices, programs, and anything else that sets forth instructions or requirements for determining the pressure limits on Southern California Gas Company's natural gas storage field reservoirs.

Response 5:

SoCalGas objects to this request as overly broad and unduly burdensome. SoCalGas interprets this request as seeking SoCalGas' current written requirements, standards, programs, and procedures that set forth the instructions or requirements for the pressures listed in Response 4. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000001 - AC_CPUC_SED_DR_27_0000064.

Question 6:

Of those documents provided in response to question 5, please list all documents that apply or applied Southern California Gas Company's Aliso Canyon natural gas storage facility.

Response 6:

The following documents provided in response to question 5 apply to SoCalGas' Aliso Canyon storage field: Bates range AC_CPUC_SED_DR_27_0000065 - AC_CPUC_SED_DR_27_0000115.

Question 7:

Of those documents provided in response to question 5, please list all documents that applied as of October 23, 2015.

Response 7:

The following documents applied as of October 23, 2015: Bates range AC_CPUC_SED_DR_27_0000117 -AC_CPUC_SED_DR_27_0000131. On October 23, 2015, there was a prior version of Gas Standard 224.070. For the version of Gas Standard 224.070 that existed on October 23, 2015 please see the electronic document with Bates Range AC_CPUC_SED_DR_27_0000116.

Question 8:

Of those documents provided in response to question 5, please list all documents that applied prior to October 23, 2015.

Response 8:

The following documents applied prior to October 23, 2015: Bates range AC_CPUC_SED_DR_27_0000153 -AC_CPUC_SED_DR_27_0000168. Prior to October 23, 2015, there were earlier versions of Gas Standard 224.070. For the earlier versions of Gas Standard 224.070 that existed prior to October 23, 2015, please see electronic document with Bates range AC_CPUC_SED_DR_27_0000132 -AC_CPUC_SED_DR_27_0000151.

Question 9:

Of those documents requested in questions 3 and 5, are there any that were in existence, but that Southern California Gas Company no longer has?

Response 9:

No.

Question 10:

If the answer to question 9 is yes, please list all such documents.

Response 10:

N/A.

Question 11:

Based upon the documents provided in response to question 5, did SoCalGas use a formula or formulas to calculate the maximum pressures identified in response to question 2 for the reservoirs at Aliso Canyon on October 23, 2015?

Response 11:

Yes.

Question 12:

If the answer to question 11 is yes, please provide the formula or formulas.

a. Please be sure to identify each variable in the formula;
b. Provide a definition of each variable in the formula;
c. Refer to the document and page of the document provided in response to question 4 that is the basis for each formula provided.

Response 12:

Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000001 - AC_CPUC_SED_DR_27_0000064.

Question 13:

As of October 23, 2015, please identify each reservoir in Aliso that had its reservoir pressure (or concept identified in response to question 4) kept below the results of the required formula or formulas identified in response to question 12.

Response 13:

There is only one gas storage reservoir at Aliso Canyon – the Sesnon-Frew Gas Storage Zone. On October 23, 2015, the reservoir pressure of the Sesnon-Frew Gas Storage Zone was below the maximum reservoir pressure of 3600 psi.

Question 14:

For the Standard Sesnon reservoir at Aliso Canyon as of October 22, 2015, please identify each variable in the formulas used to calculate the concepts identified in response to question 2, and provide the definition of each variable.

Response 14:

There is no "Standard Sesnon" reservoir at Aliso Canyon. There is only one gas storage reservoir at Aliso Canyon – the Sesnon-Frew Gas Storage Zone.

Question 15:

Please identify the impact of the most recently installed compressors at Aliso Canyon on the overall reservoir pressure (or term SoCalGas uses to refer to reservoir pressure). Please include the minimum and maximum reservoir pressures for each reservoir at Aliso since the installation of those compressors, as well as the date of each such reservoir pressure.

Response 15:

The recently installed compressors do not affect the maximum and minimum reservoir pressures of the Sesnon-Frew Zone storage reservoir at Aliso Canyon.

Question 16:

What is the impact of the overall storage volume of each Aliso Canyon reservoir on the reservoir pressure of that reservoir? If this impact can be expressed in a formula, please include that formula, the reference and page number for that formula, and an explanation for how that formula was derived.

Response 16:

Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000023 - AC_CPUC_SED_DR_27_0000045.

Question 17:

Has SoCalGas used reservoir pressure (or term SoCalGas uses to refer to reservoir pressure) in order to determine which wellhead to place on each well at its storage facilities? If so, please provide all such wells that have received wellheads that account for reservoir pressure.

Response 17:

Yes, the maximum reservoir pressure is used to determine which wellhead to place on each well. All wells have received wellheads with a pressure rating above the maximum reservoir pressure.

Question 18:

Are wellheads components of well facilities?

Response 18:

The wellhead is a component of a gas storage well. Components of a gas storage well include, but are not limited to, the wellhead, tubing, casing, packers and valves.

Question 19:

Do wellheads have restrictions with regards to pressure they can withstand from injection and withdrawal?

Response 19:

Wellheads are designed for pressure that exceeds reservoir pressure, thus wellheads are able to withstand withdrawal and injection pressure.

Question 20:

With regards to wellheads discussed in response to questions 19-21, did the wellhead on SS25 in any way impair the ability to kill SS25? Please explain.

Response 20:

No, the wellhead did not impair the ability to kill SS25. SoCalGas had access to all the wellhead valves and connected to the wellhead in the first attempt to kill the well. The wellhead functioned as expected.

Prior to pumping any kill fluid, SoCalGas had Cameron West Coast service the primary seals in the wellhead by injecting plastic sealant to re-energize the primary and secondary seals around the 7" casing inside the wellhead.

Question 21:

It is SED's understanding that SoCalGas used the tubing and the casing on SS25 to inject and withdraw gas prior to October 23, 2015. Is this understanding correct? If so:

a. When did SoCalGas start this practice of injecting and withdrawing gas through the casing on SS25?
b. Why did SoCalGas decide to inject and withdraw gas through the casing on SS25?
c. When SoCalGas started the practice of injecting and withdrawing gas through the casing on SS25, did SoCalGas do any safety related studies or analyses with regards to withdrawing or injecting gas into the casing?
d. Specifically, when SoCalGas started the practice of injecting and withdrawing gas through the casing on SS25, did SoCalGas study the conditions under which the casing would leak?
    i. If so, please provide all such studies.
    ii. If not, why not?

Response 21:

For SS25, SoCalGas withdrew gas through both the tubing and the tubing-casing annulus, and injected gas through the tubing-casing annulus.

a. Gas was moved through the casing in SS25 since SoCalGas first began operating the well. SoCalGas previously provided CPUC-SED with a data response listing the month/time range of initial withdrawal/injection for all wells. Please see electronic documents with Bates range Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000169 -AC_CPUC_SED_DR_27_0000174.
b. Prior to October 23, 2015, withdrawal and injection through the casing was industry practice. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000175 -AC_CPUC_SED_DR_27_0000350.
c. At Aliso Canyon prior to the conversion of wells to tubing flow only, in general, high structure wells were operated as casing flow and lower structure wells were operated as tubing flow. For more information, please see the electronic document with Bates range AC_CPUC_SED_DR_27_0000351-AC_CPUC_SED_DR_27_0000411.
d. See Response 21.c.

Question 22:

Please provide a list of all wells within SoCalGas storage facilities for which SoCalGas has injected and/or withdrawn gas through well casing.

Response 22:

SoCalGas interprets this request as seeking information about SoCalGas' Aliso Canyon storage field. SoCalGas previously provided CPUC-SED with a data response that lists the month/time range of initial withdrawal/injection for all wells. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000412 -AC_CPUC_SED_DR_27_0000417.

Question 23:

Please answer questions 21 a-d again, but this time for the entire list of wells provided in response to question 22.

Response 23:

For the Aliso Canyon wells within SoCalGas for which SoCalGas has injected and/or withdrawn gas through the well casing:

a. Gas was moved through the casing in these wells since SoCalGas first began operating the well. SoCalGas previously provided CPUC-SED with a data response listing the month or time range of initial withdrawal/injection for all wells. Please see

electronic documents with Bates range AC_CPUC_SED_DR_27_0000169 - AC_CPUC_SED_DR_27_0000174.

b. Prior to October 23, 2015, withdrawal and injection through the casing was industry practice. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000175 -AC_CPUC_SED_DR_27_0000350.
c. At Aliso Canyon, prior to the conversion of wells to tubing flow only, in general, high structure wells were operated as casing flow and lower structure wells were operated as tubing flow. For more information, please see the electronic document with Bates range AC_CPUC_SED_DR_27_0000351 -AC_CPUC_SED_DR_27_0000411.
d. See Response 21.c.

Question 24:

Did SoCalGas provide notice to any agencies when it decided to move gas through the casing on well SS25? If so:

a. Which agencies?
b. Please provide all documentation showing such notice for each well.

Response 24:

a. SoCalGas moved gas through the casing in SS25 since the initiation of gas storage operations in the 1970s. There was no requirement to provide formal notice. However, SoCalGas understands that the Division of Oil, Gas and Geothermal Resources (DOGGR) was aware that gas was moved through the casing in SS25.
b. N/A.

Question 25:

If the answer to question 24 is no, please explain.

Response 25:

N/A.

Question 26:

Please list the titles of, and provide, all industry practices and standards that support and/or allow injecting and withdrawing gas through well casings.

Response 26:

A representative listing of industry practices and standards that support and/or allow injecting and withdrawing gas through well casings include:

- American Petroleum Institute, American Gas Association, Interstate Natural Gas Association of America, *Underground Natural Gas Storage Integrity & Safe Operations,* July 6, 2016, pp. 55-56.
- Final Report of the Interagency Task Force on Natural Gas Storage Safety, *Ensuring Safe and Reliable Underground Natural Gas Storage*, October 2016, p. 54.

Question 27:

Please list the titles of, and provide, all SoCalGas requirements, standards, practices, memoranda, internal reports, and other documentation that supports and/or allows injecting and withdrawing gas through well casings.

Response 27:

N/A.

Question 28:

How many active wells did SoCalGas have in its existing natural gas storage facilities prior to October 23, 2015?

Response 28:

For a list of SoCalGas wells at SoCalGas' natural gas storage facilities on or around 10/23/15, please see electronic document with Bates range AC_CPUC_SED_DR_27_0000418.

Question 29:

Of the number of wells provided in response to question 28, how many injected and/or withdrew gas through casing?

Response 29:

Please see electronic document with Bates range AC_CPUC_SED_DR_27_0000419.

Question 30:

How many active wells does SoCalGas have in its existing natural storage facilities as of the date of this data request?

Response 30:

For a list of active wells at the Aliso Canyon storage field please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000421 -AC_CPUC_SED_DR_27_0000423. For a list of active wells at the non-Aliso storage fields (Playa del Rey, Honor Rancho, and La Goleta), please see electronic document with Bates range AC_CPUC_SED_DR_27_0000420.

Question 31:

Of the number of wells provided in response to question 30, how many inject and/or withdraw gas through casing?

Response 31:

None.

Question 32:

How many of the number of wells provided in response to question 31 are at SoCalGas's Aliso Canyon natural gas storage facility?

Response 32:

N/A.

Question 33:

What was the maximum pressure for each of the pressures identified in response to question 1 for wells at SoCalGas natural gas storage facilities as of October 23, 2015?

a. Please provide the supporting document, including reference to page number, for the maximum pressure provided in response to question 34.

Response 33:

Please see Response 1.

Question 34:

What is maximum pressure for each of the pressures identified in response to question 1 for wells at SoCalGas natural gas storage facilities based upon as of the date of this data request?

Response 34:

Please see Response 1.

Question 35:

How has the basis for calculating the maximum pressures identified in response to question 1 for wells at SoCalGas natural gas storage facilities changed from October 23, 2015 to the date of this data request?

Response 35:

Please see Response 1.

Question 36:

Provide a spreadsheet showing:

a. All SoCalGas storage facility wells that currently have subsurface safety valves.
b. All SoCalGas storage facility wells that no longer have subsurface safety valves.
c. The date of installation of each subsurface safety valve.
d. The date of removal of each subsurface safety valve that was removed.
e. Whether the subsurface safety valve isolates/isolated tubing?
f. Whether the subsurface safety valve isolates/isolated casing?
g. Depth of the subsurface safety valve.
h. If the subsurface safety valve was removed, reason for removal.

Response 36:

a. For a list of current active wells with shallow set SSSVs, please see electronic document with Bates range AC_CPUC_SED_DR_27_0000424.

b. – h.:
SoCalGas objects to requests 36 b-h as overly broad and unduly burdensome. Notwithstanding this objection, SoCalGas responds as follows: SoCalGas previously prepared and provided this information to CPUC-SED for the Aliso Canyon storage field. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000426 - AC_CPUC_SED_DR_27_0000430. In addition, SoCalGas previously provided the CPUC with a copy of a data request response to DOGGR. That data request response included a narrative regarding SoCalGas' experience with deep-set SSSVs at SoCalGas' storage fields, and correspondence that SoCalGas had in its records regarding SSSVs. Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000431 - AC_CPUC_SED_DR_27_0003343.

Questions 37-40 – On September 6, 2018, counsel for SED provided clarification on Questions 37-40 as follows: "items 37-40 of DR 27 should reference both "job history file" and "well history file"."

Question 37:

Please provide SoCalGas's definition of job history and well history files as of October 23, 2015.

Response 37:

As of October 23, 2015, SoCalGas' well file had four components – (1) well history file, (2) log file, (3) survey file, and (4) invoice file. There was no "job history file." However, the "well history

file" included DOGGR Form OG-103 (History of Oil and Gas) which details the rig work performed on a well during drilling, abandonment, and workover operations.

Question 38:

Please identify all records that must be kept in SoCalGas's job history and well history files as of October 23, 2015.

Response 38:

Please see Response 37. SoCalGas' practice is to include the following types of documents in the "well history file": DOGGR Form OG-103 (Well History Report), DOGGR Form OG-100 (Well Summary), Notices of Intent (NOI), Permits to Drill/Rework, and Workover Programs. Operators are required to submit OG-103 and OG-100 to DOGGR within 60 days after the drilling completion, suspension, or abandonment of a well.

Question 39:

Please provide all SoCalGas requirements, standards, practices, memoranda, internal reports, and other documentation that show the types of records that were required to be kept in SoCalGas's job history files as of October 23, 2015.

Response 39:

SoCalGas interprets this request as seeking SoCalGas' formal written requirements, standards, practices, memoranda, internal reports, and other formal written documents that show the types of records required to be kept for a well. For SoCalGas Records Management and Retention Schedule as of and prior to October 23, 2015, please see electronic documents with Bates range AC_CPUC_SED_DR_27_0003344 -AC_CPUC_SED_DR_27_0004205.

Question 40:

Please provide the job history file for SS25 as it looked on October 23, 2015.

Response 40:

Please see Response 37. For the "well history file" for SS25, please see electronic documents with Bates range AC_CPUC_SED_DR_27_0004206 -AC_CPUC_SED_DR_27_0004430.

Question 41:

Please list the titles of, and provide, all SoCalGas requirements, standards, practices, memoranda, internal reports, and other documentation that relate to creating, maintaining, keeping, retaining, modifying and deleting job history files between the point in time at which SoCalGas acquired Aliso Canyon natural gas storage facility and October 23, 2015.

Response 41:

SoCalGas interprets this request as seeking SoCalGas' formal written requirements, standards, practices, memoranda, internal reports, and other formal written documents that relate to creating, maintaining, modifying and deleting well file information from the point in time at which SoCalGas acquired the Aliso Canyon storage field and October 23, 2015. SoCalGas objects to this request as overly broad and unduly burdensome. Notwithstanding this objection, SoCalGas responds as follows: For SoCalGas' Records Management and Retention Schedules as of and prior to October 23, 2015, please see electronic documents with Bates range AC_CPUC_SED_DR_27_0003344 -AC_CPUC_SED_DR_27_0004205.

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED AUGUST 14, 2018

SOCALGAS RESPONSE DATED SEPTEMBER 14, 2018

SoCalGas provides the following Responses to the CPUC-Safety and Enforcement Division's (CPUC-SED) data request dated August 14, 2018 related to the preliminary investigation regarding the Aliso Canyon Well Leak. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding before any court, action. Finally, at the time of this Response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

In response to SED's request that SoCalGas' date all documents and authenticate those dates, SoCalGas responds that all documents that represent email communications provide the sender's name, the recipient(s), and reflect the date on which the communication was made; for all other documents, information regarding the creator, and the date on which the document was created, may be ascertained by reviewing the document's meta-data.

Question 1:

For this set of questions, please refer to Application (A.) 10-12-006, also called the "Application of Southern California Gas Company for authority to update its gas revenue requirement and base rates effective on January 1, 2012." Please specifically refer to Exhibit (Exh.) No. SCG-04-CWP, entitled "Capital Workpapers to Prepared Direct Testimony of James D. Mansdorfer on Behalf of Southern California Gas Company, Before the Public Utilities Commission of the State of California, December 2010". The page numbers of this document are shown as "JDM-CWP" followed by the page number. This document will be provided for convenience as Attachment A.

In this document, SCG provided recorded and forecasted costs for years 2009 – 2012 for various gas storage budget categories, as listed in 1(a) – (f) below. Each question below (Questions 1(a) – (f)) references a page number of Exh. No. SCG-04-SWP. For each question, please provide a spreadsheet (six spreadsheets in total) that itemizes all wells that were identified as part of these forecasted costs. Within each of the six spreadsheets, please provide the following columns:

1. the name of each well that SoCalGas used to justify its forecast expenditures in Exh. No. SCG-04-CWP;
2. the name of each well that received actual expenditures for the work noted in the identified workpaper page from 2009 to 2012.
3. the field in which each listed well is located;
4. the date(s) at which each well in column 1 was identified as requiring the type of work noted in the workpaper;
5. the date(s) at which each well in column 2 was identified as requiring the type of work noted in the workpaper;
6. what steps, if any, were taken to remediate or repair the well between the date of the filing of the 2012 GRC (Dec. 15, 2010) and the date of the filing of the 2016 GRC (Nov. 14, 2014);
7. the total amount spent on each well listed in column 1 in 2009;
8. the total amount spent on each well listed in column 1in 2010;
9. the total amount spent on each well listed in column 1 in 2011;
10. the total amount spent on each well listed in column 1 in 2012;
11. the total amount spent on each well listed in column 2 in 2009;
12. the total amount spent on each well listed in column 2 in 2010;
13. the total amount spent on each well listed in column 2 in 2011;
14. the total amount spent on each well listed in column 2 in 2012;
15. provide the title of each document that existed as of December 2010 (the date listed on Exh. No. SCG-04-CWP) showing the forecasted expenditure for each well listed in column 1;
16. provide the title of each document created to show the actual expenditures for each well listed in column 2;
17. provide the title of each document that verified the scope of work that existed as of December 2010 (the date listed on Exh. No. SCG-04-CWP) for each well listed in column 1.
18. provide the title of each document that verified the actual work completed for each well listed in column 2.
19. Separately from the spreadsheet, provide separate folders containing the documents requested in columns 13, 14, 15, and 16. Please ensure that each of these folders contain one seamless document with pages in order of Bates stamp, and that each document is searchable, and printable in the same fashion shown electronically.

The spreadsheets with the 16 columns listed above should be created for the following pages in Exh. No. SCG-04-CWP of A.10-12-006.

a. Exh. No. SCG-04-CWP, pp. JDM-CWP-1 and JDM-CWP-2, with Project Title, "Gas Transmission – Storage – Compressor Stations – Blanket"
b. Exh. No. SCG-04-CWP, p. JDM-CWP-5, "Project Title, Gas Storage – Wells –Blanket"
c. Exh. No. SCG-04-CWP, p. JDM-CWP-6, "Project Title, Storage Wells – Leaking Wellhead Replacements/Upgrades",
d. Exh. No. SCG 04-CWP, p. JDM-CWP-7, "Project Title, Storage Wells – Two Well Replacements".

e. Exh. No. SCG 04-CWP, p. JDM-CWP-8, "Project Title, Storage Wells –Expended Tubing Replacements"
f. Exh. No. SCG 04-CWP, p. JDM-CWP-10, "Project Title, Aliso Canyon – Valve Replacement Program".

Response 1:

Based on SoCalGas' review of existing information readily available, SoCalGas responds as follows: Please see the electronic document with Bates range AC_CPUC_SED_DR_24_0000001. Please note, the document contains a summary of total capital expenditures recorded by field for the budget codes identified in the data request. Data was not available by well, and some data was not available by field and is summarized for multiple fields. In addition, the document contains forecasts for 2010-2012.

Question 2:

For this set of questions, please refer to Application (A.) 14-11-004, also called the "General Rate Case Application of Southern California Gas Company, dated November 14, 2014." Please specifically refer to Exhibit (Exh.) No. SCG-06-CWP, entitled "Capital Workpapers to Prepared Direct Testimony of Phillip E. Baker on Behalf of Southern California Gas Company, Before the Public Utilities Commission of the State of California, November 2014". This document will be provided for convenience as Attachment B.

In this document, SCG provided recorded and forecasted costs for years 2009 – 2012 for various gas storage budget categories, as listed in question 2(a) – (f) below. Each question below (Questions 2(a) – (f))references a page number in Exh. No. SCG-06-CWP. For each question, please provide a spreadsheet (six spreadsheets in total) that itemizes all wells that were identified as part of these forecasted costs. Within each of the six spreadsheets, please provide the following columns:

1. the name of each well that SoCalGas used to justify its forecast expenditures in Exh. No. SCG-06-CWP;
2. the name of each well that received actual expenditures for the work noted in the identified workpaper page from 2009 to 2015.
3. the field in which each listed well is located;
4. the date(s) at which each well in column 1 was identified as requiring the type of work noted in the workpaper;
5. the date(s) at which each well in column 2 was identified as requiring the type of work noted in the workpaper;
6. what steps, if any, were taken to remediate or repair each well shown in column 1 between the date of the filing of the A.14-11-004 (Nov. 14, 2014), and October 22, 2015;
7. the total amount spent on each well listed in column 1 in 2009;
8. the total amount spent on each well listed in column 1in 2010;
9. the total amount spent on each well listed in column 1 in 2011;
10. the total amount spent on each well listed in column 1 in 2012;
11. the total amount spent on each well listed in column 1 in 2013;

12. the total amount spent on each well listed in column 1 in 2014;
13. the total amount spent on each well listed in column 1 in 2015 (through October 22);
14. the total amount spent on each well listed in column 2 in 2009;
15. the total amount spent on each well listed in column 2 in 2010;
16. the total amount spent on each well listed in column 2 in 2011;
17. the total amount spent on each well listed in column 2 in 2012;
18. the total amount spent on each well listed in column 2 in 2013;
19. the total amount spent on each well listed in column 2 in 2014;
20. the total amount spent on each well listed in column 2 in 2015 (through October 22);
21. provide the title of each document that existed as of November 2014 (the date listed on Exh. No. SCG-06-CWP) showing the forecasted expenditure for each well listed in column 1;
22. provide the title of each document created to show the actual expenditures for each well listed in column 2;
23. provide the title of each document that verified the scope of work that existed as of November 2014 (the date listed on Exh. No. SCG-04-CWP) for each well listed in column 1.
24. provide the title of each document that verified the actual work completed for each well listed in column 2.
25. Separately from the spreadsheet, provide separate folders containing the documents requested in columns 19, 20, 21, and 22. Please ensure that each of these folders contain one seamless document with pages in order of Bates stamp, and that each document is searchable, and printable in the same fashion shown electronically.

The spreadsheets with the 22 columns listed above should be created for the following pages in Exh. No. SCG-04-CWP of A.14-11-003.

a. Gas Storage – Compressor Stations – Blanket projects: see p. 9 of 156, A.14- 11-003, Exh. No. SCG-06-CWP
b. Gas Storage – Wells – Blanket Projects: see pp. 67-68 of 156, A.14-11-003, Exh. No. SCG-06-CWP
c. Wellhead Leak Repairs: see pp. 27-28 of 156, A.14-11-003, Exh. SCG-06-CWP
d. Replacement Wells: see pp. 57-58 of 156, A.14-11-003, Exh. SCG-06-CWP
e. Well Tubing Replacements: see pp. 22-23 of 156, A.14-11-003, Exh. SCG-06-CWP
f. Wellhead Valve Replacements: see pp. 17-18 of 156, A.14-11-003, Exh. SCG- 06-CWP
g. Well Inner-string installations: see pp. 32-33 of 156, A.14-11-003, Exh. SCG- 06-CWP.
h. Plug and Abandon Wells: see pp. 62-63 of 156, A.14-11-003, Exh. SCG-06-CWP.

Response 2:

Based on SoCalGas' review of existing information readily available, SoCalGas responds as follows: Please see the electronic document with Bates range AC_CPUC_SED_DR_24_0000001. Please note, the document contains a summary of total capital expenditures recorded by field for the budget codes identified in the data request. Data was not available by well, and some data was not available by field and is summarized for multiple fields. In addition, the document contains forecasts for 2010-2012.

Question 3:

In Phillip Baker's (A.14-11-003 testimony, Exh. SCG-06, attached as exhibit C), several references, shown under the heading "References in Mr. Baker's testimony" below, were made to work required on specific wells and classes of well. For each reference listed below, please provide in a spreadsheet a list of all wells that were identified by SCG as requiring the type of work described in that part of Mr. Baker's testimony, as of the date of the 2016 GRC filing (Nov. 14, 2014).

For each well identified for each reference, please also provide in separate columns of the spreadsheet including:

1. the name of the well(s) that are included as part of the reference;
2. the field in which the well is located;
3. the date at which the well was identified as requiring the type of work described in the category;
4. all steps, if any, were taken to remediate or repair the well between the date of the filing of A.14-11-003 (Nov. 14, 2014) and the October 22, 2015.
5. What steps, if any, were taken to remediate or repair the well between October 23, 2015 and the date of this data request.
6. Provide the titles of the documents that existed as of November 14, 2014 which shows that the well identified in column a had been identified as requiring the type of remediation/repair work described in Mr. Baker's testimony. Please ensure there is authentication of those dates. Please ensure that each document is clearly labeled as referring to one of the listed wells.
7. Provide the titles of the documents that existed as of November 14, 2014 which shows that the well identified in column a had been shown as experiencing the kind of problem(s) described in Mr. Baker's testimony. Please ensure there is authentication of those dates. Please ensure that each document is clearly labeled as referring to one of the listed wells.

References in Mr. Baker's Testimony:

a. "For example in 2013, again at Aliso Canyon, two wells were found to have leaks in the production casing at depths adjacent to the shallower oil production sands." see: p. PEB-19, lns. 5 – 7, A.14-11-003, Exh. SCG-06.
b. "The increasing number of safety and integrity conditions summarized in Table PEB-8 below is attributed primarily to the frequency of use, exposure to the environment, and length of time the wells have been in service." For this question, please ensure to include in the spreadsheet each well identified in Table PEB-8. [Table PEB-8, Number of Major Well Integrity Workovers by Year]" see: p. PEB- 19, lns. 11 – 17, 2016 GRC Exh. SCG-06.
c. "Ultrasonic surveys conducted in storage wells as part of well repair work from 2008 to 2013 identified internal/external casing corrosion, or mechanical damage in 15 wells." See: PEB-19, lns. 17 – 18, 2016 GRC Exh. SCG-06
d. "External casing corrosion has been observed at relatively shallow depths in the production casing, and at deeper intervals near the Aliso Canyon shallow oil production zone at which [sic] is being water-flooded." See: PEB-19, lns. 18 – 21, 2016 GRC Exh. SCG-06
e. "Internal mechanical wear has been observed in production casings, likely as a result of drilling operations that took place when the well was originally drilled." See: PEB-19, lns. 21 – 22, 2016 GRC Exh. SCG-06
f. "…external tubing corrosion has been observed on tubing in the joint above the packer most likely as a result of stagnant fluid." See: PEB-19 – PEB-20, lns. 22 – 2, 2016 GRC Exh. SCG-06
g. "…SoCalGas has 52 storage wells in service that are more than 70 years old." See: PEB-20, lns. 4 – 5, 2016 GRC Exh. SCG-06
h. "Half of the 229 storage wells are more than 57 years old as of July 2014." See: PEB-20, lns. 5 – 6, 2016 GRC Exh. SCG-06
i. "In summary, it is expected that the oldest wells in closest proximity to the public, located in environmentally or safety-sensitive areas that have not had recent downhole inspections or work would likely be prioritized for inspection." See: PEB-22, lns. 14 – 17, 2016 GRC Exh. SCG-06
j. Table PEB-10, Southern California Gas Company Capital Expenditures Summary of Capital Expenditures Summary of Costs (Thousands of $2013). Please include all storage compressors included in the $8,991,000 number in the column entitled "2013 Recorded".
k. Table PEB-10, Southern California Gas Company Capital Expenditures Summary of Capital Expenditures Summary of Costs. Please include all storage wells included in the $10,976,000 number in the column entitled "2013 Recorded".

Response 3:

The references in (g) and (h) do not relate to work required on specific wells, but instead are references regarding the age of the wells. Therefore, given that no specific work was described, columns (c) through (g) are not applicable.

g. Based on SoCalGas' review of relevant documents, SoCalGas responds as follows:

Please see the electronic document with Bates range AC_CPUC_SED_DR_24_0000002.

h. Based on SoCalGas' review of relevant documents, SoCalGas responds as follows:

   Please see the electronic document with Bates range AC_CPUC_SED_DR_24_0000002.

Please note, SoCalGas is compiling the remaining information requested in Question 3 and will supplement this response as soon as possible.

Question 4:

In A.14-11-006, Exh. SCG-06, p. 77 of 156 states, "Safety and/or integrity conditions that are presently unknown may exist within the high pressure (up to 3,600 psig) above ground pipe laterals and below ground facilities that comprise of 229 aging gas storage field wells that can exceed 13,000 feet in depth."

1. Please list the "229 aging storage field wells that can exceed 13,000 feet in depth", which were noted in that statement.
2. Please provide the document that was available in November 2014, the date shown on Exh. SCG-06, that shows these "229 aging storage field wells that can exceed 13,000 feet in depth".

Response 4:

The testimony refers to 229 aging storage fields and some can exceed 13,000 feet in depth. The three storage field wells that exceed 13,000 feet in depth are the WEZU 13A, WEZU 23, and WEZU 25C wells at the Honor Rancho storage field. In November 2014, this information was contained in the well file.

MA. 54

AC_CPUC_0072304
AC_CPUC_0072305
AC_CPUC_0072306
AC_CPUC_0072307.1982.paleontological ...
AC_CPUC_0072310.1982.redrilling
AC_CPUC_0072315.no.date.costs
AC_CPUC_0072316.no.date.notes
AC_CPUC_0072317.2014.Notice to Aband...
AC_CPUC_0072319.2014.receipt
AC_CPUC_0072320.2014.receipt
AC_CPUC_0072321.2014.permit
AC_CPUC_0072322.2006.permit
AC_CPUC_0072323.2006.permit
AC_CPUC_0072324.2006.permit
AC_CPUC_0072325.2005.Notice
AC_CPUC_0072326.2006.Squeeze
AC_CPUC_0072329.1982.notes
AC_CPUC_0072330
AC_CPUC_0072331

	SS25			SS25A		
	Surface Casing P, psi	Casing P, psi	Tubing P, psi	Surface Casing P, psi	Casing P, psi	Tubing P, psi
01/08/10	0	1938	1937	0	700	1348
01/15/10	0	1870	1870	0	700	1340
01/22/10	0	1790	1789	0	750	1403
01/29/10	0	1704	1704	0	600	490
02/04/10	0	1695	1695	0	700	485
02/12/10	0	1614	1615	0	875	484
02/18/10	0	1665	1667	0	875	480
02/26/10	0	1691	1694	0	875	483
03/05/10	0	1800	1800	0	875	484
03/18/10	0	1988	1980	0	900	480
03/26/10	0	2033	2030	0	875	491
04/02/10	0	2115	2105	0	875	492
04/09/10	0	2169	2160	0	750	488
04/16/10	0	2224	2225	0	700	482
04/23/10	0	2282	2274	0	550	450
04/30/10	0	2314	2310	0	500	458
05/07/10	0	2377	2371	0	575	529
05/14/10	0	2402	2401	0	950	103
05/21/10	0	2411	2409	0	1050	608
05/28/10	0	2459	2459	0	1050	960
06/07/10	0	2512	2510	0	1100	1545
06/18/10	0	2590	2590	0	1200	1839
06/25/10	0	2640	2635	0	1275	1910
07/02/10	0	2670	2670	0	1325	1975
07/10/10	0	2759	2749	0	1375	2046
07/19/10	0	2683	2682	0	1450	2110
07/31/10	0	2690	2690	0	1500	2190
08/06/10	0	2670	2670	0	0	0
08/13/10	0	2695	2690	0	0	0
08/20/10	0	2605	2605	0	0	0
08/27/10	0	2475	2475	0	0	0
09/03/10	0	2540	2540	0	0	0
09/11/10	0	2590	2590	0	0	0

SED SUR_REPLY_002136

09/18/10	0	2530	2530	0	0	0
09/24/10	0	2580	2580	0	0	0
10/02/10	0	2525	2525	0	0	0
10/15/10	0	2715	2705	0	0	0
10/22/10	0	2770	2765	0	0	0
10/29/10	0	2775	2775	0	0	0
11/04/10	0	2785	2785	0	0	0
11/13/10	0	2740	2740	0	0	0
11/20/10	0	2733	2733	0	0	0
11/27/10	0	2565	2565	0	0	0
12/03/10	0	2445	2445	0	0	0
12/10/10	0	2390	2390	0	0	0
12/17/10	0	2355	2360	0	0	0
12/31/10	0	2325	2335	0	0	0
01/10/11	0	1945	1950	0	0	0
01/14/11	0	1725	1725	0	0	0
01/22/11	0	1685	1685	0	0	0
01/28/11	0	1600	1600	0	0	0
02/05/11	0	1350	580	0	0	0
02/12/11	0	1220	1220	0	495	495
02/18/11	0	1230	1230	0	470	590
02/26/11	0	520	520	0	480	1375
03/05/11	0	1110	1110	0	470	1965
03/25/11	0	1225	1227	0	466	1740
04/01/11	0	1284	1288	0	471	1734
04/08/11	0	1332	1336	0	469	1727
04/15/11	0	1379	1383	0	480	1719
04/22/11	0	1616	1597	0	500	1710
04/29/11	0	1691	1676	0	500	1706
05/06/11	0	1788	1771	0	500	1710
05/13/11	0	1853	1842	0	500	1718
05/21/11	0	1933	1919	0	480	1728
05/28/11	0	2023	2011	0	500	1740
06/03/11	0	2071	2072	0	500	1755
06/10/11	0	2162	2156	0	500	1770
06/17/11	0	2233	2225	0	500	1794
06/23/11	0	2298	2282	0	500	1817
07/01/11	0	2344	2335	0	500	1849

07/09/11	0	2360	2358	0	500	1876
07/16/11	0	2493	2485	0	500	1922
07/23/11	0	2510	2500	0	500	1956
07/30/11	0	2522	2514	0	500	1989
08/06/11	0	2574	2561	0	500	2025
08/13/11	0	2619	2606	0	500	2053
08/20/11	0	2594	2586	0	500	2077
08/27/11	0	2456	2457	0	500	2094
09/03/11	0	2420	2420	0	500	2120
09/10/11	0	2360	2360	0	500	2150
09/17/11	0	2505	2505	0	500	2170
09/24/11	0	2565	2565	0	470	2190
10/01/11	0	2610	2610	0	470	2220
10/21/11	0	2670	2671	0	480	2217
10/31/11	0	2839	2844	0	500	2315
11/23/11	0	2750	2750	0	500	2180
12/03/11	0	2710	2715	0	500	2190
12/12/11	2	2424	2423	2	440	1744
12/16/11	0	2175	1025	0	500	1335
12/22/11	0	2235	2235	0	500	1615
12/31/11	0	2310	2315	0	500	1670
01/06/12	0	2360	2365	0	500	1750
01/20/12	0	2195	835	0	510	1555
01/28/12	0	2175	2180	0	500	1540
02/03/12	0	2110	735	0	480	1500
02/11/12	0	2185	2185	0	470	1505
02/18/12	2	2100	2100	0	500	1396
02/28/12	0	2140	2140	0	470	1455
03/03/12	0	2140	2140	0	470	1455
03/10/12	0	2080	2080	0	470	1400
03/16/12	0	2100	2100	0	470	1400
03/23/12	0	2055	2055	0	470	1355
03/30/12	0	2055	2055	0	470	1355
04/14/12	0	2265	2260	0	500	1600
04/20/12	0	2260	2260	0	500	1600
04/28/12	0	2315	2315	0	500	1645
05/05/12	0	2390	2390	0	500	1735
05/12/12	0	2420	2425	0	470	1810

05/18/12	0	2490	2495	0	470	1885
05/25/12	0	2525	2530	0	470	1960
06/02/12	0	2555	2655	0	470	2040
06/11/12	0	2625	2665	0	470	2120
06/16/12	0	2735	2735	0	470	2155
06/22/12	0	2775	2775	0	470	2220
06/28/12	0	2775	2775	0	470	2220
07/07/12	2	2863	2862	0	500	2348
07/14/12	0	2758	2758	0	500	2396
07/21/12	0	2779	2782	0	500	2445
07/28/12	0	2750	2730	0	480	2483
08/03/12	2	2704	2704	2	500	2505
08/10/12	0	2450	760	0	500	1785
08/18/12	1	2380	1429	5	500	1495
08/24/12	0	2585	2565	0	500	1775
09/07/12	0	2540	2540	0	500	1865
09/14/12	0	2520	2520	0	500	2095
09/22/12	0	2515	2515	0	500	2065
09/27/12	0	2515	2515	0	500	2065
10/05/12	0	2580	2575	0	500	2190
10/12/12	0	2635	2635	0	500	2255
10/19/12	0	2685	2685	0	500	2305
10/26/12	0	2785	2785	0	470	2360
11/02/12	0	2800	2800	0	470	2360
11/09/12	0	2775	2770	0	470	2460
11/16/12	0	2755	2755	0	470	2475
12/07/12	0	2740	2740	0	470	2665
12/14/12	0	2740	2740	0	470	2585
12/29/12	0	0	0	0	0	0
01/05/13	0	0	0	0	500	2600
01/12/13	0	2265	2265	0	500	2185
01/19/13	0	2020	2020	0	490	1630
02/02/13	0	1300	1300	0	500	1290
02/08/13	0	1300	1300	0	500	1280
02/15/13	0	1815	1815	0	470	1180
02/22/13	0	1280	1300	0	500	104
03/02/13	0	1140	1525	0	490	805
03/08/13	0	1760	1760	0	475	1075

03/15/13	0	1770	1770	0	475	1075
03/22/13	0	1840	1840	0	470	1270
03/29/13	0	1840	1840	0	470	1320
04/05/13	0	1860	1865	0	470	1385
04/12/13	0	1830	1830	0	470	1240
04/20/13	0	1895	1895	2	660	1345
04/26/13	0	1895	1895	2	660	1345
05/03/13	0	2075	2070	0	500	1475
05/10/13	0	2200	2180	0	470	1570
05/17/13	0	2225	2205	0	470	1620
05/31/13	0	2345	2330	0	470	1765
06/06/13	0	2410	2405	0	470	1835
06/15/13	0	2470	2470	10	500	1917
06/22/13	1	2543	2543	10	500	1982
06/29/13	0	0	0	5	500	1864
07/05/13	0	2475	2465	0	500	1580
07/12/13	0	2520	2520	0	500	1750
07/19/13	0	2515	2515	0	500	1865
07/26/13	0	2515	2515	0	470	1865
08/03/13	0	2615	2605	0	470	2030
08/09/13	0	2620	2610	0	500	2035
08/19/13	3	2625	2625	5	500	2157
08/23/13	0	2625	2625	0	500	2160
08/30/13	0	2415	1110	0	500	1560
09/07/13	0	2351	2351	5	500	1430
09/13/13	0	2505	2495	0	470	1615
09/27/13	0	2625	2610	0	470	1860
10/05/13	1	2657	2657	5	480	1983
10/21/13	0	2615	2660	0	470	2125
11/22/13	0	2560	2560	0	470	2135
11/30/13	1	2515	2511	5	500	2200
12/06/13	0	2510	2510	0	500	2235
12/13/13	0	0	0	0	520	1215
12/21/13	0	1392	1392	5	500	711
01/04/14	1	1658	1790	5	480	557
01/11/14	0	1520	1625	0	500	505
01/17/14	0	1490	1595	0	500	505
01/24/14	0	1520	1430	0	495	495

01/31/14	0	1420	1330	0	495	495
02/07/14	0	520	520	0	500	530
02/22/14	0	499	499	5	480	492
03/01/14	0	495	495	0	495	490
03/28/14	0	897	898	0	470	893
04/04/14	0	910	910	0	470	900
04/11/14	0	1010	910	0	470	935
04/19/14	0	1099	1099	0	500	968
04/26/14	0	1170	1180	0	470	995
05/03/14	0	1305	1305	0	470	1035
05/09/14	0	1305	1305	0	470	1035
05/16/14	0	1495	1495	0	470	1110
05/30/14	0	1615	1615	0	470	1190
06/06/14	0	1665	1665	0	470	1250
06/13/14	0	1835	1835	0	470	1305
06/21/14	0	1920	1922	0	500	1366
07/11/14	0	2050	2050	0	470	1515
07/18/14	0	2100	2100	0	470	1565
07/26/14	0	2155	2155	0	470	1650
07/30/14	0	2160	2160	0	470	1650
08/09/14	0	0	0	0	0	0
08/22/14	0	2270	2270	0	470	1750
08/29/14	0	2320	2320	0	470	1800
09/15/14	0	0	0	0	0	0
09/22/14	0	0	0	0	0	0
09/26/14	0	2565	2553	0	500	2599
10/06/14	0	2575	2565	0	500	2610
10/11/14	0	2550	2550	1	480	2540
10/17/14	0	2600	2600	0	480	2590
10/24/14	0	2395	2395	0	500	2550
10/31/14	0	0	0	0	0	0
12/06/14	0	2316	2318	0	500	2511
12/15/14	1	2212	2212	1	500	2360
12/20/14	1	2047	2045	1	500	2235
12/29/14	1	1930	1930	1	480	2175
01/03/15	1	1882	1886	1	500	2122
01/09/15	0	1890	1890	0	475	2125
01/17/15	1	0	0	1	500	0

01/22/15	0	1940	1940	0	470	2120
01/31/15	1	1960	1960	1	470	2140
02/07/15	0	1975	1980	0	470	2130
02/13/15	0	1790	1790	0	470	1895
02/21/15	0	0	0	0	0	0
03/06/15	0	1850	1850	0	470	1900
03/14/15	1	2035	2005	1	470	2130
03/19/15	0	2145	2110	0	470	2260
03/27/15	0	2213	2280	0	480	2320
04/10/15	0	2255	2215	0	470	2370
04/18/15	1	2305	2265	1	470	2400
04/24/15	0	2335	2300	0	470	2460
05/01/15	0	2415	2340	0	470	2510
05/07/15	0	0	0	0	0	0
05/22/15	0	2425	2405	0	470	2455
05/29/15	0	2468	2461	0	500	2541
06/05/15	0	2470	2470	0	470	2550
06/15/15	0	0	0	0	0	0
06/19/15	0	2335	2345	0	475	2480
06/26/15	0	2468	2460	0	500	2505
07/02/15	0	2516	2500	0	500	2584
07/11/15	20	2505	2495	1	470	2540
07/18/15	1	2505	2495	1	470	2540
07/24/15	0	2460	2460	0	475	2550
07/30/15	0	2490	2490	0	470	2580
08/07/15	0	2380	2380	0	470	2505
08/12/15	0	2445	2445	0	470	2575
08/20/15	0	2558	2537	0	500	2644
08/27/15	0	0	0	0	0	0
09/05/15	1	2540	2540	1	470	2640
09/11/15	0	2680	2680	0	470	2700
09/18/15	0	2610	2600	0	470	2635
09/25/15	0	2595	2595	0	470	2305
10/01/15	0	0	0	0	0	0
10/15/15	0	0	0	0	0	0
10/31/15	0	0	0	0	0	0
11/13/15	0	0	0	0	0	0
11/19/15	0	0	0	0	0	0

11/27/15	0	0	0	0	0	0
12/04/15	0	0	0	0	0	0
12/11/15	0	0	0	0	0	0
12/18/15	0	0	0	0	0	0
12/26/15	0	0	0	0	0	0
01/02/16	0	0	0	0	0	0
01/08/16	0	0	0	0	0	0
01/15/16	0	0	0	0	0	0
01/23/16	0	0	0	0	0	0
01/29/16	0	0	0	0	0	1157
02/06/16	0	0	0	0	0	1144
03/02/16	0	0	0	3	0	47
03/03/16	0	0	0	6	0	991
03/04/16	0	0	0	38	0	987
03/05/16	0	0	0	5	0	1000
03/06/16	0	0	0	5	0	1166
03/07/16	0	0	0	4	5	1017
03/08/16	0	0	0	5	0	1051

SS25B

Surface Casing P, psi	Casing P, p	Tubing P, psi
0	1990	1987
0	1920	1920
0	1840	1839
0	1745	1750
0	1733	1736
0	1653	1654
0	1693	1693
0	1711	1716
0	1808	1801
0	2015	1964
0	2048	2025
0	2159	2087
0	2214	2139
0	2235	2213
0	2307	2266
0	2336	2316
0	2401	2366
0	2437	2401
0	2459	2410
0	2481	2450
0	2508	2509
0	2605	2583
0	2650	2630
0	2690	2670
0	2759	2729
0	2687	2688
0	2690	2690
0	2685	2685
0	2705	2705
0	2625	2625
0	2500	2500
0	2555	2555
0	2600	2600

P25R

Surface Casing P, psi	Casing P, psi	Tubing P, psi
0	2251	2257
0	2230	2230
0	2190	2190
0	1907	1907
0	1983	1985
0	1689	1692
0	1899	1899
0	1909	1909
0	1903	1903
0	2033	2023
0	2058	2053
0	2170	2170
0	2161	2155
0	2259	2253
0	2300	2298
0	2350	2347
0	2388	2395
0	2456	2450
0	2417	2414
0	2493	2489
0	2555	2555
0	2618	2619
0	2655	2655
0	2705	2700
0	2765	2765
0	2616	2616
0	2705	2705
0	2710	2710
0	2710	2710
0	2675	2675
0	2620	2620
0	2625	2625
0	2665	2665

SS3H

Surface Casing P, psi	Casing P, psi	Tubing P, psi
0	784	519
0	730	1580
0	740	525
0	710	507
0	697	1765
0	693	1377
0	689	1698
0	689	1615
0	685	1751
0	687	1816
0	685	1905
0	685	1960
0	686	2013
0	686	2073
0	687	2130
0	686	2188
0	688	2249
0	689	2297
0	689	2331
0	692	2369
0	694	2422
0	696	2468
0	695	2505
0	700	2545
0	698	2590
0	699	2608
0	700	2635
0	700	2640
0	700	2615
0	720	555
0	710	2270
0	705	2450
0	705	2470

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0	2545	2545	0	2615	2615	0	710	2475
0	2585	2585	0	2615	2615	0	710	2490
0	2535	2535	0	2560	2560	0	710	2480
0	2720	2685	0	2710	2710	0	710	2570
0	2770	2750	0	2780	2780	0	715	2625
0	2780	2780	0	2825	2830	0	715	2690
0	2790	2790	0	2805	2805	0	715	2715
0	2750	2750	0	2750	2750	0	720	2710
0	2733	2733	0	2744	2744	0	719	2701
0	2595	2595	0	2655	2655	0	745	540
0	2470	2470	0	2470	2470	0	725	2410
0	2410	2420	0	2555	2555	0	725	2430
0	2380	2380	0	2535	2535	0	725	2385
0	2350	2350	0	2480	2480	0	725	2320
0	1980	1980	0	1615	705	0	750	500
0	1755	1755	0	1575	1575	0	730	1575
0	1705	1705	0	1950	1950	0	720	1525
0	1620	1620	0	1625	1625	0	680	490
0	535	595	0	580	540	0	670	520
0	1240	1240	0	1295	1295	0	615	470
0	1245	1245	0	1395	1395	0	615	475
0	1125	520	0	765	530	0	635	475
0	1125	1125	0	1485	1485	0	615	1095
0	1245	1244	0	1527	1527	0	613	1124
0	1796	1794	0	1522	1522	0	611	1290
0	1353	1351	0	1525	1525	0	611	1337
0	1393	1393	0	1531	1532	0	611	1356
0	1547	1547	0	1594	1591	0	611	1450
0	1717	1641	0	1715	1711	0	611	1508
0	1817	1726	0	1821	1821	0	612	1605
0	1878	1805	0	1882	1882	0	612	1668
0	1957	1890	0	1969	1969	0	614	1755
0	2047	1982	0	2044	2044	0	615	1836
0	2086	2051	0	2115	2115	0	615	1901
0	2185	2130	0	2186	2193	0	615	1963
0	2256	2205	0	2255	2249	0	617	2045
0	2316	2263	0	2289	2284	0	617	2102
0	2357	2320	0	2360	2352	0	618	2161

0	2366	2349	0	2377	2375	0	620	2215
0	2513	2460	0	2523	2523	0	623	2280
0	2532	2472	0	2507	2508	0	625	2315
7	2535	2500	0	2553	2552	0	627	2353
0	2602	2528	0	2474	2474	0	629	2379
0	2643	2580	0	2450	2450	0	629	2414
0	2603	2577	0	2466	0	0	633	2447
0	2479	2479	0	2478	2478	0	656	522
0	2440	2440	0	2460	2460	0	640	2320
0	2385	2385	0	2565	2565	0	645	2025
0	2515	2515	0	2645	2645	0	640	2360
0	2575	2575	0	2685	2685	0	645	2425
0	2620	2620	0	2635	2635	0	640	2450
10	2686	2687	0	2841	2843	0	652	2557
15	2929	2844	0	2935	2938	0	658	2714
1	2765	2760	0	2830	2830	0	680	2525
1	2730	2725	0	2820	2820	0	670	2670
1	2463	2463	0	1779	724	0	690	1491
0	2245	980	0	2080	2080	0	685	1755
1	2285	2280	0	2325	2325	0	675	480
1	2345	2340	0	2340	2340	0	675	470
0	2385	2385	0	2350	2350	0	675	470
0	2250	960	0	2360	2360	0	675	505
1	2210	2210	0	2280	2280	0	675	2230
1	2220	2215	0	2270	2270	0	685	1910
1	2215	2215	0	2240	2240	0	680	2140
8	2138	2138	0	2188	2185	0	680	1997
1	2165	2165	0	2190	2190	0	680	2105
1	2165	2165	0	2190	2190	0	680	2105
1	2065	2115	0	2140	2140	0	680	1975
1	2085	2125	0	2170	2170	0	680	1980
1	2040	2095	0	2215	2215	0	685	1940
1	2040	2095	0	2230	2230	0	695	1515
0	2270	2265	0	2255	2255	0	700	510
0	2260	2260	0	2250	2250	0	700	515
0	2330	2310	0	2345	2345	0	680	2225
0	2390	2385	0	2430	2430	0	680	2290
0	2435	2420	0	2450	2450	0	680	2335

0	2490	2490	0	2565	2565	0	685	2380
0	2515	2520	0	2630	2630	0	685	2430
0	2550	2550	0	2665	2665	0	685	2485
0	2670	2630	0	2695	2695	0	685	2520
0	2650	2650	0	2755	2755	0	685	2560
0	2695	2695	0	2790	2790	0	685	2590
0	2695	2695	0	0	0	0	685	2590
0	0	2820	0	2894	2894	0	696	2695
0	0	2762	0	2756	2758	0	675	2695
0	2800	2799	0	2790	2790	0	676	2719
0	2735	2735	0	2725	2725	0	682	2709
0	2710	2710	0	2707	2708	0	676	2687
0	2515	2480	0	2529	2531	0	700	525
0	2377	2376	0	2550	2555	0	696	530
0	2620	2525	0	2620	2620	0	680	2370
0	2590	2550	0	2530	2530	0	680	2365
0	2250	2250	0	2515	2515	0	695	530
0	2565	2520	0	2610	2610	0	680	2425
0	2565	2520	0	2605	2605	0	680	2425
0	2590	2560	0	2610	2610	0	685	2365
0	2645	2645	0	2720	2720	0	680	2525
0	2695	2695	0	2750	2750	0	680	2575
0	2795	2785	0	2810	2810	0	685	2625
0	2800	2800	0	2810	2810	0	685	2650
0	2785	2785	0	2805	2805	0	685	2680
0	2765	2765	0	2800	2800	0	685	2680
0	2740	2740	0	2740	2740	0	690	2710
0	2750	2750	0	2740	2740	0	690	2715
0	0	0	0	0	0	0	0	0
0	1140	2410	0	2690	2690	0	715	525
0	1070	2270	0	2390	2390	0	700	2055
0	1905	2290	0	31840	1840	0	700	1835
0	935	2090	0	2080	2080	0	710	510
0	930	2080	0	2075	2075	0	700	500
0	1725	1930	0	1540	1555	0	710	520
0	1000	1780	0	2010	2010	0	710	525
0	655	1820	0	1925	1925	0	710	500
0	1765	1730	0	1925	1925	0	710	485

0	1765	1765	0	1920	1920	0	710	485
0	1855	1860	0	1910	1910	0	695	1790
0	1850	1855	0	1905	1905	0	695	1775
0	1875	1880	0	1900	1900	0	695	1840
0	1825	1850	0	1720	1720	0	695	1685
0	1912	1919	0	1888	1853	0	692	1858
0	1910	1920	0	1890	1855	0	690	1860
0	2105	2050	0	2065	2065	0	695	1925
0	2235	2160	0	2240	2240	0	690	2000
0	2270	2185	0	2290	2290	0	690	2050
0	2440	2345	0	2445	2440	0	690	2180
0	2470	2420	0	2470	2475	0	690	2230
0	2542	2484	0	2557	2550	0	692	2304
0	2590	2550	0	2615	2615	0	691	2355
0	2487	2490	0	2570	2570	0	705	1658
0	2490	2460	0	2510	2510	0	700	2170
0	2540	2510	0	2480	2480	0	695	2355
0	2525	2525	0	2565	2565	0	695	2390
0	2525	2525	0	2565	2565	0	695	2390
0	2635	2600	0	2650	2650	0	695	2445
0	2640	2605	0	2660	2660	0	695	2450
0	2635	2618	0	2649	2654	0	695	2496
0	2625	2620	0	2655	2655	0	695	2495
0	980	2445	0	2570	2570	0	715	530
0	2391	2388	0	2433	2433	0	733	1922
0	2530	2495	0	2550	2550	0	700	2330
0	2610	2610	0	2680	2680	0	700	2440
1	2695	2635	0	2717	2717	0	696	2707
0	2630	2655	0	2605	2605	0	695	2680
0	2575	2570	0	2520	2520	0	700	2620
1	2538	2538	0	2513	2510	0	700	2600
0	2535	2535	0	2510	2510	0	700	2600
0	795	2005	0	980	995	0	720	2610
0	719	1795	0	1593	1593	0	715	1944
0	688	1629	0	1009	1028	0	704	1812
0	645	1475	0	1070	1070	0	670	1655
0	645	1475	0	1040	1040	0	670	1625
0	635	1370	0	635	645	0	650	500

0	635	1370	0	635	645	0	650	500
0	760	550	0	515	515	0	650	500
0	496	509	0	877	877	0	690	490
0	490	490	0	492	640	0	689	488
0	891	889	0	1043	1043	0	664	931
0	900	900	0	1055	1055	0	665	950
0	1035	1035	0	1080	1080	0	665	1030
0	1129	1129	0	1110	1110	0	660	1125
0	1490	1490	0	1500	1495	0	665	1205
0	1635	1360	0	1640	1640	0	665	1285
0	1635	1360	0	1640	1640	0	665	1285
0	1520	1520	0	1660	1660	0	690	1440
0	1835	1650	0	1845	1845	0	725	1565
0	1800	1700	0	1900	1900	0	725	1620
2	1990	1850	0	1860	1860	0	770	1720
3	1955	1937	0	2063	2064	0	790	1790
4	2050	2050	0	2100	2100	0	0	0
4	2100	2100	0	2150	2150	0	0	0
7	2155	2155	0	2165	2165	0	0	0
7	2160	2160	0	2170	2170	0	0	0
0	0	0	0	2111	2113	0	0	0
7	2270	2270	0	2140	2140	0	0	0
7	2350	2350	0	2190	2190	0	0	0
7	0	0	0	2350	2350	0	0	0
0	0	0	0	2400	2400	0	0	0
0	2599	2532	0	2622	2622	0	0	0
0	2600	2540	0	2630	2630	0	0	0
24	2555	2555	0	2580	2580	0	0	0
24	2605	2605	0	2630	2630	0	0	0
28	2422	2422	0	2475	2475	0	0	0
28	0	0	0	0	0	0	0	0
40	2345	2345	0	2435	2435	0	0	0
35	2168	929	1	1968	788	1	0	0
33	850	1997	1	826	842	0	0	0
35	1930	1930	1	1525	1525	0	0	0
37	1900	1900	1	1871	1871	1	1314	1892
0	1920	1920	0	1610	1610	0	865	495
36	0	0	1	0	0	1	0	0

37	1975	1975	0	2040	2040	0	815	1935
35	1995	1995	1	2060	2060	1	815	1955
36	2010	2010	0	2090	2090	0	910	1990
36	1785	1785	0	710	725	0	765	505
36	0	0	0	0	0	0	0	0
36	1850	1850	0	1865	1865	0	765	1850
35	1980	1980	1	1935	1935	1	855	1910
35	2100	2100	0	2025	2025	0	980	2015
36	2165	2146	0	2073	2073	0	1066	2080
36	2205	2205	0	2105	2105	0	1100	2120
36	2250	2250	1	2200	2200	1	1100	2150
36	2310	2310	0	2190	2190	0	1250	2210
36	2405	2405	0	2280	2280	0	1495	2295
36	0	0	0	0	0	0	0	0
36	2415	2415	0	2350	2350	0	2180	2325
36	2530	0	0	2554	2556	0	1135	2303
36	2550	2550	0	2570	2570	0	1135	2315
37	0	0	0	0	0	0	0	0
37	2365	2365	0	1490	1525	0	995	520
36	2500	2459	0	2520	2520	0	1158	2334
38	2577	2485	0	2592	2592	0	1434	2369
40	2540	2485	1	2565	2565	1	1265	2370
40	2540	0	1	2490	2490	1	1265	2370
42	2480	2480	0	2485	2485	0	1215	2260
42	2510	2510	0	2515	2515	0	1215	2290
41	2415	2415	0	2375	2375	0	1115	2170
41	2470	2470	0	2440	2440	0	1130	2260
40	2633	2530	0	2663	2659	0	1091	2349
41	0	0	0	0	0	0	0	0
43	2640	2635	1	2465	2465	1	495	2350
41	2680	2680	0	2610	2610	0	495	2400
44	2635	2595	0	2655	2655	0	1405	2475
44	2620	2620	0	2605	2605	0	1245	2415
46	0	0	0	0	2658	0	1485	2562
44	0	0	0	0	0	0	1485	512
0	0	0	0	2514	2514	0	934	498
0	0	0	0	2465	2465	0	895	500
0	0	0	0	2365	2365	0	845	505

0	0	0	0	2315	2315	0	815	489
0	0	0	0	2283	2283	0	793	504
0	0	0	0	2147	2151	0	0	507
0	0	0	0	2047	2052	0	668	552
0	0	0	1	1275	605	1	630	505
0	0	0	1	540	506	1	648	507
0	0	0	0	517	511	0	648	489
0	0	0	0	1130	1130	0	629	970
0	0	0	0	1362	1362	0	0	0
0	0	28	0	1397	1397	0	0	0
0	38	0	1	1397	1396	0	0	0
38	6	1036	0	1397	1397	0	0	0
38	0	17	0	1395	1395	0	0	0
0	0	15	0	1391	1390	16	0	0
37	0	9	0	1393	1393	0	0	0
37	0	17	0	1395	1394	3	0	0
38	0	17	0	1394	1394	0	1	0
36	17	0	0	1393	1393	0	1	0

SS5

Surface Casing P, psi	Casing P, psi	Tubing P, psi
0	1773	946
0	1820	1820
0	1656	856
0	1550	810
0	1641	1641
0	1553	1553
0	1626	1624
0	1653	1649
0	1804	1794
0	1992	1983
0	2050	2048
0	2165	2164
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0
0	2506	2510
0	2604	2604
0	2650	2650
0	2695	2695
0	2760	2757
0	2671	2670
0	2690	2690
0	2650	2650
0	2700	2700
0	2545	2545
0	2410	2410
0	2530	2530
0	2660	2640

SS4B

Surface Casing P, psi	Casing P, psi	Tubing P, psi
0	2231	1556
0	2180	1620
0	1657	598
0	1972	547
0	1960	1746
0	1898	518
0	1852	1739
0	1840	1395
0	1782	1151
0	2033	2023
0	2064	2057
0	2177	2176
0	2231	2230
0	2250	2270
0	2263	2284
0	2354	2352
0	2425	2423
0	2450	2451
0	2473	2469
0	2502	2501
0	2517	2526
0	2616	2616
0	2660	2655
0	2705	2695
0	2775	2769
1	2636	2685
0	2710	2700
0	2710	1375
0	2715	2695
0	2685	810
0	2610	790
0	2590	2545
0	2680	2670

SS44A

Surface Casing P, psi	Casing P, psi
0	1773
0	1720
0	1267
0	1230
0	1649
0	646
0	1736
0	568
0	844
0	2037
0	2062
0	2176
0	2230
0	2249
0	2261
0	2353
0	2422
0	2450
0	2471
0	2499
0	2517
0	2614
0	2655
0	2705
0	2768
0	2613
0	2650
0	2350
0	2635
0	2240
0	2085
0	2465
0	2670

0	2515	2515	0	2430	2420	0	2455
0	2575	2575	0	2595	2575	0	2510
0	2540	2535	0	2480	2475	0	2480
0	2720	2710	0	2730	2730	0	2725
0	2770	2765	0	2785	2785	0	2780
0	2775	2775	0	2760	2760	0	2730
0	2780	2780	0	2805	2795	0	2735
0	2725	2725	0	2830	2675	0	2695
0	2723	2725	0	2789	2751	0	2693
0	2380	1260	0	2700	795	0	2550
0	2390	2390	0	2590	730	0	2425
0	2350	2350	0	2485	700	0	2475
0	2315	2315	0	2395	715	0	2335
0	2320	2320	0	2420	2195	0	2325
0	1775	930	0	2135	675	0	980
0	1585	830	0	1950	815	0	870
0	1660	1655	0	1825	790	0	720
0	1550	1550	0	1800	840	0	680
0	1325	730	0	550	550	0	605
0	1195	1195	0	735	490	0	1040
0	1200	1200	0	705	515	0	1120
0	1065	515	0	670	490	0	1100
0	1080	1080	0	1160	1160	0	1140
0	1223	1222	0	1365	1360	0	1154
0	1284	1282	0	1466	1458	0	1478
0	1328	1328	0	1470	1464	0	1293
0	1375	1374	0	1445	1442	0	1455
0	1571	1560	0	1584	1582	0	1597
0	1715	1692	0	1724	1724	0	1724
1	1813	1788	0	1825	1825	0	1829
1	1883	1863	0	1890	1890	0	1891
1	1975	1956	0	1970	1970	0	1969
1	2044	2024	0	2076	2076	0	2076
1	2085	2080	0	2110	2110	0	2112
1	2182	2162	0	2175	2177	0	2177
1	2240	2222	0	2257	2251	0	2257
1	2295	2280	0	2327	2322	0	2327
1	2384	2375	0	2362	2362	0	2362

0	2366	2361	0	2380	2380	0	2379
1	2510	2495	0	2489	2525	0	2525
1	2493	2480	0	2545	2545	0	2543
0	2536	2524	4	2550	2549	0	2549
1	2598	2578	0	2615	2614	0	2614
1	2636	2620	0	2600	2597	0	2429
1	2644	2630	0	2616	2614	0	2615
1	2305	913	0	1676	980	0	2080
1	2380	2380	0	2415	2415	0	2320
1	2525	2465	0	2550	2545	0	2545
1	2620	2585	0	2640	2640	0	2630
1	2665	2630	0	2680	2680	0	2675
1	2715	2675	0	2695	2695	0	2740
0	2642	2641	0	2834	2832	0	2827
0	2924	2898	0	2928	2930	0	2923
1	2725	2720	0	2700	2700	0	2700
1	2690	2640	0	2685	2685	0	2655
0	2248	987	0	1790	1386	0	2440
1	2260	2260	0	1680	1110	0	2305
1	2070	980	0	1895	935	0	2005
1	2275	2275	0	2285	2290	0	2270
1	2320	2320	0	2370	2385	0	2315
1	1995	975	0	1760	865	0	1965
0	2140	2140	0	2150	2150	0	2195
1	2135	2135	0	1985	1985	0	2215
1	2150	2150	0	2180	2180	0	2000
0	2058	2059	0	1925	1925	0	1973
1	2060	2060	0	2130	2130	0	2135
1	1955	765	0	2130	2130	0	2135
1	2045	2045	0	2075	2075	0	1885
1	2075	2075	0	2080	2080	0	1890
1	2200	2150	0	1995	1995	0	1965
1	2200	2150	0	1995	1995	0	1965
0	2100	835	0	2330	2330	0	2300
0	2150	2150	0	2370	2370	0	2340
0	2465	2425	0	2345	2345	0	2340
0	2385	2385	0	2420	2420	0	2340
0	2435	2435	0	2445	2445	0	2445

0	2590	2570	0	2455	2455	0	2435
0	2515	2515	0	2535	2545	0	2525
0	2545	2650	0	2585	2585	0	2505
0	2670	2690	0	2700	2700	0	2500
0	2745	2755	0	2790	2790	0	2555
0	2675	2785	0	2790	2790	0	2580
0	2675	2785	0	2785	2785	0	2630
0	2795	2873	0	2827	2820	0	2886
0	2745	2775	0	2789	2789	0	2697
0	2798	2854	0	2808	2800	0	2705
0	2730	2752	0	2752	2752	0	2700
0	2710	2704	0	2750	2730	0	2685
0	2417	1006	0	995	570	0	2600
0	2246	996	0	1483	1520	0	2435
0	2480	2480	0	2620	2620	0	2440
0	2520	2520	0	2480	2480	0	2480
0	2400	1200	0	2450	2450	0	2485
0	2505	2500	0	2580	2580	0	2465
0	2500	2500	0	2580	2580	0	2465
0	2520	2520	0	2605	2605	0	2485
0	2635	2635	0	2640	2640	0	0
0	2685	2685	0	2690	2690	0	0
0	2800	2790	0	2820	2820	0	2625
0	2810	2810	0	2850	2850	0	0
0	2780	2780	0	2800	2800	0	2695
0	2780	2780	0	2800	2800	0	2700
0	2730	2730	0	2765	2765	0	2705
0	2720	2720	0	2770	2770	0	2705
0	0	0	0	0	0	0	0
0	2260	1230	0	950	995	0	2175
0	2115	1155	0	830	925	0	1965
0	1920	660	0	1255	1315	0	2045
0	1870	575	0	665	755	0	2095
0	1870	570	0	660	750	0	2090
0	1775	1775	0	890	950	0	2040
0	1720	640	0	625	730	0	2050
0	1660	1660	0	570	720	0	2000
0	1700	560	0	645	750	0	2005

0	1700	560	0	645	750	0	2005
0	1820	1820	0	1950	1940	0	1970
0	1820	1820	0	1760	1755	0	1960
0	1850	1850	0	1960	1945	0	1965
0	1800	1800	0	1665	1655	0	1975
0	1885	1885	0	1952	1943	0	2016
0	1885	1885	0	1950	1945	0	2015
0	2105	2080	0	2120	2120	0	2115
0	2225	2200	0	2245	2240	0	2160
0	2270	2240	0	2305	2305	0	2200
0	2440	2400	0	2465	2465	0	2270
0	2470	2450	0	2285	2490	0	2280
0	2542	2519	0	2559	2559	0	2351
0	2590	2582	0	2614	2612	0	2610
0	2503	2506	0	1737	1737	0	2426
0	2495	2480	0	2505	2490	0	2505
0	2465	2465	0	2500	2500	0	2480
0	2510	2510	0	2560	2560	0	2560
0	2510	2510	0	2560	2560	0	2560
0	2640	2620	0	2650	2650	0	2650
0	2645	2625	0	2655	2655	0	2655
0	2640	2630	0	2656	2656	0	2647
0	2640	2630	0	2655	2655	0	2650
0	2350	1050	0	1250	1280	0	2160
0	2314	2314	0	1740	1790	0	2272
0	2530	2510	0	2550	2540	0	2545
0	2655	2635	0	2680	2680	0	2475
1	2695	2664	1	2620	2620	1	2512
0	2605	2605	0	2645	2645	0	21
0	2545	2545	0	2600	2600	0	0
0	2500	2500	1	2591	2594	0	0
0	2500	2500	0	2590	2590	0	0
0	1845	955	0	690	775	0	17
1	1562	596	0	790	830	1	32
0	1470	615	0	557	755	0	74
0	1355	575	0	1300	1305	0	80
0	1355	575	0	1270	1270	0	80
0	1270	570	0	505	820	0	140

0	1270	570	0	505	820	0	140
0	960	545	0	510	510	0	122
0	800	518	0	499	499	0	0
0	751	510	0	497	497	0	55
0	918	916	0	1242	1233	0	242
0	930	930	0	1260	1250	0	245
0	1025	1025	0	1260	1255	0	220
1	1095	1095	0	1277	1277	0	217
0	1170	1170	0	1310	1310	0	230
0	1270	1270	0	1345	1345	0	245
0	1270	1270	0	1345	1345	0	245
0	1465	1465	0	1575	1575	0	250
0	1590	1590	0	1855	1860	0	60
0	1650	1650	0	1910	1910	0	60
0	1985	1930	0	2000	2000	0	1
0	2054	2003	0	2070	2070	0	0
0	2160	2120	0	2075	2075	0	0
0	2210	2170	0	2125	2125	0	0
0	2155	2155	0	2165	2165	0	0
0	2160	2160	0	2170	2170	0	0
0	2343	2292	0	2358	2362	0	0
0	2360	2330	0	2375	2375	0	0
0	2410	2380	0	2425	2425	0	0
0	2465	2420	0	2410	2440	0	0
1	2515	2470	0	2440	2440	0	0
0	2600	2551	0	2493	2612	0	0
1	2610	2560	0	2505	2620	0	0
0	2545	2545	0	2540	2560	0	0
1	2595	2595	0	2610	2610	0	0
0	2335	2335	0	2423	2423	0	0
0	0	0	0	0	0	0	0
0	2244	2244	0	2249	2324	0	0
1	1976	1033	1	786	780	0	0
1	1820	815	1	641	723	0	0
1	1710	675	1	1550	1575	0	0
1	1793	1793	1	2014	2014	0	0
0	1680	720	0	1560	1625	0	0
1	0	0	1	0	0	0	0

0	1915	1915	0	2110	2110	0	0
1	1925	1925	1	2130	2130	0	0
0	1960	1960	0	2125	2125	0	0
0	1560	605	0	565	735	0	0
0	0	0	0	0	0	0	0
0	1850	1850	0	1850	1850	0	0
1	1920	1920	1	2025	2025	0	0
0	2030	2030	0	2105	2105	0	0
0	2150	2150	0	2154	2154	0	0
0	2125	2125	0	2190	2190	0	0
1	2175	2175	1	2240	2240	0	0
0	2215	2215	0	2285	2285	0	0
0	2315	2315	0	2385	2385	0	0
0	0	0	0	0	0	0	0
0	2345	2345	0	2440	2440	0	0
0	2387	2387	0	2560	2560	0	0
0	2400	2400	0	2570	2570	0	0
0	0	0	0	0	0	0	0
0	2150	780	0	1420	1490	0	0
0	2402	2402	0	2522	2520	0	0
0	2419	2417	0	2606	2606	0	0
1	2435	2435	1	2565	2565	0	0
1	2435	2435	1	2565	2565	0	0
0	2440	2440	0	2500	2500	0	0
0	2470	2470	0	2530	2530	0	0
1	2340	2340	0	2435	2430	0	0
1	2400	2400	0	2560	2560	0	0
1	2458	2452	0	2663	2666	0	0
1	0	0	0	0	0	0	0
1	2475	2475	1	2660	2660	0	0
1	2620	2620	0	2610	2610	0	0
1	2550	2550	0	2655	2655	0	0
0	2565	2565	0	2635	2635	0	0
0	2427	2424	0	2668	2665	0	1
1	2125	1055	0	1879	1008	0	0
26	2060	870	0	1493	735	0	0
26	1988	788	0	1400	665	0	0
96	1721	711	0	1330	625	0	0

91	1706	688	0	1285	525	0	0
91	1572	657	0	1227	532	0	0
91	1275	600	0	1113	532	0	0
91	692	537	0	521	515	0	0
84	545	535	1	530	525	0	0
83	509	510	1	514	509	0	0
84	504	504	0	507	506	0	0
82	981	1015	0	1227	1228	0	0
82	0	0	0	1377	1377	0	0
82	4	0	0	1366	1363	0	1356
80	0	0	1	1366	1364	0	1364
79	0	0	0	1362	1362	0	1354
78	0	0	0	1363	1362	0	1362
78	0	0	0	1352	1351	0	1351
78	0	0	0	1363	1360	0	1360
79	2	0	0	1361	1360	0	0
77	1	0	0	1361	1358	0	1366
78	0	0	0	1360	1359	0	0

	SS44			SS9			SS29
Tubing P, psi	Surface Casing P, psi	Casing P, psi	Tubing P, psi	Surface Casing P, psi	Casing P, psi	Tubing P, psi	Surface Casing P, psi
1779	0	0	0	1	2294	1315	0
1720	0	0	0	0	2140	1880	0
592	0	0	0	0	2140	1190	0
565	0	0	0	0	2055	1195	0
1645	0	0	0	0	1950	1120	0
686	0	0	0	0	1885	1028	0
1742	0	0	0	1	1733	1685	0
1367	0	0	0	1	1717	1698	0
1401	0	0	0	1	1777	1808	0
2032	0	0	0	0	1961	2017	0
2064	0	0	0	1	2036	2055	0
2174	0	0	0	1	2098	2155	0
2230	0	0	0	1	2188	2214	0
2250	0	0	0	1	2275	2250	0
2260	0	0	0	1	2303	2310	0
2352	0	0	0	1	2328	2342	0
2422	0	0	0	0	2385	2403	0
2450	0	0	0	1	2456	2441	0
2472	0	0	0	1	2455	2459	0
2505	0	0	0	1	2482	2485	0
2520	0	0	0	1	2526	2518	0
2613	0	0	0	1	2613	2608	0
2650	0	0	0	1	2650	2645	0
2695	0	0	0	1	2700	2700	0
2770	0	0	0	0	2763	2763	0
2613	0	0	0	0	2681	2681	0
2650	0	0	0	1	2695	2695	0
1010	0	0	0	1	2700	2700	0
2635	0	0	0	1	2705	2705	0
900	0	0	0	0	2650	2625	0
800	0	0	0	1	2540	2490	0
2465	0	0	0	1	2585	2560	0
2660	0	0	0	1	2650	2660	0

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2455	0	0	0	1	2525	2535	0
2510	0	0	0	1	2585	2585	0
2480	0	0	0	0	2540	2535	0
2725	0	0	0	1	2715	2720	0
2780	0	0	0	1	2750	2740	0
2730	0	0	0	1	2780	2785	0
2735	0	0	0	1	2795	2790	0
2695	0	0	0	1	2765	2750	0
2693	0	0	0	0	2752	2745	0
2550	0	0	0	1	2735	1890	0
2425	0	0	0	1	2500	2470	0
2475	0	0	0	1	2425	2410	0
2335	0	0	0	1	2415	2375	0
2325	0	0	0	1	2350	2350	0
1140	0	0	0	1	2225	1975	0
1075	0	0	0	1	2165	1160	0
1005	0	0	0	1	1860	1695	0
1020	0	0	0	1	1150	985	0
555	0	0	0	1	1695	865	0
760	0	0	0	0	1495	1220	0
505	0	0	0	1	1235	1240	0
480	0	0	0	1	670	670	0
1245	0	0	0	1	1250	1125	0
1313	0	0	0	1	1238	1234	0
1488	0	0	0	1	1293	1293	0
1343	0	0	0	1	1342	1347	0
1475	0	0	0	1	1386	1391	0
1600	0	0	0	1	1519	1572	0
1724	0	0	0	1	1687	1712	0
1827	0	0	0	0	1766	1804	0
1888	0	0	0	1	1869	1873	0
1969	0	0	0	1	1933	1950	0
2076	0	0	0	1	2041	2044	0
2110	0	0	0	1	2108	2087	0
2177	0	0	0	1	2177	2181	0
2255	0	0	0	1	2248	2254	0
2322	0	0	0	0	2318	2312	0
2362	0	0	0	0	2356	2350	0

2381	0	0	0	0	2363	2370	0
2525	0	0	0	0	2533	2513	0
2543	0	0	0	0	2537	2530	0
2547	0	0	0	0	2517	2538	0
2610	0	0	0	0	2524	2515	0
2600	0	0	0	0	2592	2572	0
2610	0	0	0	0	2604	2604	0
850	0	0	0	0	2469	1680	0
2320	0	0	0	0	2440	2430	0
2535	0	0	0	0	2355	2520	0
2625	0	0	0	0	2635	2615	0
2670	0	0	0	0	2640	2660	0
2735	0	0	0	0	2630	2590	0
2811	0	0	0	0	2664	2671	0
2914	0	0	0	1	2929	2924	0
2700	0	0	0	0	2770	2765	0
2665	0	0	0	0	2725	2725	0
2446	0	0	0	0	2595	2315	0
2310	0	0	0	0	2780	1515	0
825	0	0	0	0	2740	2175	0
2275	0	0	0	0	2485	2335	0
2325	0	0	0	0	2395	2380	0
760	0	0	0	0	2485	1515	0
2195	0	0	0	0	2305	2205	0
2225	0	0	0	0	2325	2175	0
2205	0	0	0	0	2355	2195	0
1979	0	0	0	0	2250	2121	0
2135	0	0	0	0	2175	2150	0
2135	0	0	0	0	2175	2150	0
1885	0	0	0	0	2100	2095	0
1890	0	0	0	0	2130	2130	0
1965	0	0	0	0	2080	2075	0
1965	0	0	0	0	1910	2100	0
2300	0	0	0	0	0	0	0
2340	0	0	0	0	610	2220	0
2340	0	0	0	0	685	2335	0
2340	0	0	0	0	760	2390	0
2445	0	0	0	0	860	2440	0

2435	0	0	0	0	840	2590	0
2535	0	0	0	0	890	2525	0
2510	0	0	0	0	685	2555	0
2550	0	0	0	0	680	2675	0
2555	0	0	0	0	640	2735	0
2580	0	0	0	0	660	2775	0
2630	0	0	0	0	660	2775	0
2696	0	0	0	0	690	2872	0
2700	0	0	0	0	702	2762	0
2705	0	0	0	0	691	2790	0
2700	0	0	0	0	0	0	0
2685	0	0	0	0	660	2715	0
2600	0	0	0	0	665	1820	0
2435	0	0	0	0	599	1640	0
2440	0	0	0	0	530	2505	0
2480	0	0	0	0	555	2545	0
2485	0	0	0	0	530	2525	0
2465	0	0	0	0	675	2520	0
2465	0	0	0	0	675	2520	0
2485	0	0	0	0	755	2555	0
0	0	0	0	0	825	2645	0
0	0	0	0	0	850	2700	0
2625	0	0	0	0	900	2805	0
0	0	0	0	0	900	2800	0
2695	0	0	0	0	815	2785	0
2700	0	0	0	0	815	2765	0
2710	0	0	0	0	595	2750	0
2705	0	0	0	0	685	2750	0
0	0	0	0	0	0	0	0
865	0	0	0	0	510	510	0
810	0	0	0	0	505	505	0
2045	0	0	0	0	520	1175	0
2095	0	0	0	0	495	495	0
2090	0	0	0	0	500	500	0
2040	0	0	0	0	545	550	0
2050	0	0	0	0	595	600	0
2000	0	0	0	0	675	780	0
2000	0	0	0	0	740	1675	0

2005	0	0	0	0	740	1680	0
1970	0	0	0	0	930	1845	0
1960	0	0	0	0	990	1840	0
1965	0	0	0	0	1045	1855	0
1975	0	0	0	0	470	1835	0
2018	0	0	0	0	470	1973	0
2020	0	0	0	0	470	1975	0
2115	0	0	0	0	495	2110	0
2165	0	0	0	0	500	2240	0
2210	0	0	0	0	485	2160	0
2275	0	0	0	0	0	0	0
2285	0	0	0	0	0	0	0
2354	0	0	0	0	0	0	0
2574	0	0	0	0	0	0	0
2428	0	0	0	0	0	0	0
2460	0	0	0	0	0	0	0
2455	0	0	0	0	0	0	0
2520	0	0	0	0	0	0	0
2520	0	0	0	0	0	0	0
2585	0	0	0	0	0	0	0
2590	0	0	0	0	0	0	0
2667	0	0	0	0	0	0	0
2670	0	0	0	0	0	0	0
925	0	0	0	0	0	0	0
2272	0	0	0	0	0	0	0
2480	0	0	0	0	0	0	0
2475	0	0	0	0	0	0	0
2512	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0
0	0	0	0	0	710	1530	0
0	0	0	0	0	710	1530	0
0	0	0	0	0	770	860	0

0	0	0	0	0	770	860	0
0	0	0	0	0	780	685	0
0	0	0	0	0	782	572	0
0	0	0	0	0	777	535	0
-8	0	0	0	0	747	890	0
-10	0	0	0	0	745	900	0
-7	0	0	0	0	745	1010	0
0	0	0	0	0	742	1115	0
-6	0	0	0	0	745	1205	0
-5	0	0	0	0	745	1310	0
-5	0	0	0	0	745	1310	0
-4	0	0	0	0	745	1505	0
1	0	0	0	0	745	1625	0
1	0	0	0	0	745	1625	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0
0	0	0	0	0	2560	2560	0
0	0	0	0	0	2610	2610	0
0	1	0	0	0	2416	2416	0
0	1	0	0	0	0	0	0
0	0	0	0	0	2333	2333	0
0	1	0	0	1	1898	650	1
0	0	0	0	1	1758	635	1
0	0	0	0	35	1650	555	1
0	0	1	1	1	1881	1880	1
0	0	0	0	0	1660	600	0
0	1	1	1	1	0	0	1

0	0	0	0	0	1965	1960	0
0	1	0	0	1	1965	1980	1
0	0	0	0	0	2000	2000	0
0	0	0	0	0	1560	560	0
0	0	0	0	0	0	0	0
0	0	0	0	0	1560	1850	0
0	0	0	0	1	1970	1970	0
0	0	0	0	0	2085	2085	0
0	0	0	0	0	2089	2089	0
0	0	0	0	0	2190	2190	0
0	0	0	0	2	2240	2240	1
0	0	0	0	0	2295	2295	0
0	0	0	0	0	2390	2390	0
0	0	0	0	0	0	0	0
0	0	0	0	0	2405	2405	0
0	0	0	0	0	2428	2428	0
0	0	0	0	0	2440	2440	0
0	0	0	0	0	0	0	0
0	0	0	0	0	2025	710	0
0	0	0	0	0	2441	2441	0
0	0	0	0	0	2466	2461	0
0	0	0	0	1	2465	2465	4
0	0	0	0	1	2465	2465	1
0	0	0	0	0	2475	2475	0
0	0	0	0	0	2505	2505	0
0	0	0	0	0	2430	2425	0
0	0	0	0	0	2465	2460	0
0	0	1	1	0	2506	2501	0
0	0	0	0	0	0	0	0
0	1	0	0	1	2510	2505	1
0	0	0	0	0	2650	2650	0
0	0	0	0	0	2575	2575	0
0	0	0	0	0	2610	2610	0
-1	0	0	0	0	0	0	0
0	0	0	0	0	2383	2383	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

0	0	0	0	0	0	0	0
0	0	0	0	0	0	562	0
0	0	0	0	0	0	531	0
0	0	1	1	0	0	520	0
0	0	0	0	1	1020	490	1
0	1	0	0	1	926	495	1
0	0	0	0	0	926	490	0
0	0	0	0	0	810	819	0
0	0	1	1	0	873	873	0
1356	0	0	0	0	1040	1035	0
1363	1	0	0	1	1096	1039	0
1354	0	0	0	0	1048	1044	0
1362	0	0	0	0	1052	1047	0
1350	0	0	0	0	1055	1051	0
1360	0	0	0	0	1054	1058	0
0	0	0	0	0	1063	1066	0
1365	0	0	0	0	1066	1062	0
0	0	0	0	0	1070	1065	0

Casing P, psi	Tubing P, psi		P47 Surface Casing P, psi	Casing P, psi	Tubing P, psi	P38 Surface Casing P, psi	Casing P, psi	Tubing P, psi
2213	1899	40188	0	2185	2187	2	2209	2217
2130	1830	40194	0	2140	2140	1	2170	2170
2167	1449	40200	0	1055	1245	0	1570	1227
1993	1222	40206	0	960	1140	1	1530	1170
1861	1671	40213	0	1931	1930	1	1955	1955
1790	1586	40220	0	1835	1834	1	1490	714
1743	1022	40227	1	1828	1823	1	1840	1840
1641	1661	40234	1	1824	1821	1	1835	1834
1543	1801	40241	0	1861	1860	1	1862	1860
1514	1990	40255	0	1979	1971	1	1961	1962
1640	2040	40262	0	2050	2044	1	2042	2048
1969	2126	40270	0	2121	2118	1	2106	2107
2147	2172	40275	0	2148	2150	1	2140	2140
2302	2225	40282	0	2237	2231	1	2222	2224
2339	2286	40290	0	2310	2308	1	2300	2300
2272	2315	40297	0	2359	2356	1	2348	2352
2358	2380	40304	0	2400	2400	1	2391	2395
2489	2422	40312	0	2440	2440	1	2429	2430
2486	2433	40319	0	2451	2453	1	2441	2436
2480	2462	40326	0	2500	2501	1	2493	2493
2486	2508	40333	0	2555	2555	1	2550	2550
2608	2598	40348	0	2612	2620	1	2612	2612
2630	2630	40355	0	2650	2655	1	2650	2650
2685	2685	40362	0	2700	2700	1	2690	2690
2762	2747	40370	0	2761	2760	0	2749	2749
2597	2673	40378	0	2739	2790	2	2728	2718
2660	2690	40391	0	2730	2730	1	2735	2730
2670	2690	40397	0	2740	2740	1	2730	2725
2625	2695	40404	0	2745	2745	1	2735	2735
2630	2580	40411	0	2690	2690	1	2685	2685
2445	2600	40418	0	2595	2595	1	2600	2600
2520	2585	40425	0	2640	2640	1	2640	2640
2515	2665	40433	0	2665	2665	1	2655	2655

2510	2535	40440	0	2615	2615	1	2610	2610
2530	2580	40446	0	2640	2640	1	2625	2625
2375	2520	40454	0	2565	2565	1	2550	2550
2540	2700	40467	0	2710	2710	1	2695	2695
2725	2740	40474	0	2770	2770	1	2755	2755
2760	2780	40481	0	2835	2835	1	2825	2825
2780	2785	40487	0	2840	2840	1	2825	2825
2780	2735	40496	0	2815	2815	1	2805	2805
2756	2732	40503	0	2809	2809	0	2799	2799
2675	2535	40510	0	2710	2710	1	2710	2710
2540	2420	40516	0	2575	2575	1	2550	2550
2470	2375	40523	0	2475	2475	1	2475	2475
2415	2340	40530	0	2555	2555	2	2445	2445
2395	2325	40544	0	2415	2415	2	2410	2410
2195	1460	40554	0	1045	1215	2	1385	805
1995	980	40558	0	835	1005	2	1235	705
1770	1675	40566	0	1750	1750	2	1175	660
1700	1575	40572	0	725	855	2	1125	650
1670	610	40579	0	575	545	1	955	600
1420	1210	40587	0	550	525	1	875	560
1295	1225	40593	0	1270	1270	2	1270	1270
1120	1140	40601	0	525	505	1	1215	1215
945	1100	40608	0	1170	1170	2	1170	1170
482	1229	40628	0	1318	1318	1	1314	1314
473	1277	40635	0	1384	1384	1	1389	1389
472	1330	40642	0	1439	1439	1	1447	1447
472	1376	40649	0	1472	1470	1	1474	1474
490	1565	40656	1	1599	1569	1	1566	1568
505	1705	40663	1	1646	1646	1	1666	1670
487	1800	40670	0	0	0	1	1734	1736
523	1869	40677	0	0	0	1	1815	1815
567	1947	40685	0	0	0	1	1902	1904
574	2039	40692	0	0	0	1	2015	2018
632	2081	40698	0	0	0	1	2060	2062
672	2176	40705	0	0	0	1	2129	2129
675	2246	40712	0	0	0	1	2230	2228
702	2307	40718	0	0	0	1	2271	2270
694	2345	40726	0	0	0	1	2345	2345

862	2364	40733	0	0	0	1	2390	2389
1045	2508	40741	0	0	0	1	2490	2490
1206	2524	40748	0	0	0	1	2483	2481
1315	2530	40754	0	0	0	2	2529	2522
1438	2592	40762	0	0	0	1	2550	2547
1593	2610	40769	0	0	0	1	2600	2600
1664	2588	40776	0	0	0	1	2606	2603
1714	2437	40783	0	0	0	2	2196	2511
1585	2400	40790	0	0	0	2	2555	2555
1525	2440	40797	0	0	0	2	2525	2525
1685	2565	40804	0	0	0	1	2590	2590
1760	2615	40811	0	2630	2625	1	2625	2625
1845	2585	40818	0	2690	2685	2	2685	2685
2677	2656	40838	0	2802	2792	2	2797	2793
2964	2887	40848	0	2912	2899	2	2893	2892
2770	2740	40871	0	2825	2815	2	2815	2815
2620	2700	40881	0	2815	2810	2	2810	2810
2658	2389	40889	0	2193	1107	1	2607	2606
2540	2225	40894	0	2430	2430	2	1845	985
2475	2205	40900	0	2090	1015	2	1625	940
2475	22950	40909	0	2470	2465	1	2475	2475
2490	2350	40915	0	2490	2485	1	2490	2490
2470	1685	40929	0	2470	2470	1	1710	955
2315	2160	40937	0	2335	2335	1	2345	2345
2335	2165	40943	0	2350	2350	1	1590	905
2320	2160	40951	0	2330	2330	1	2340	2340
2227	2085	40957	0	2272	2273	0	2284	2283
2255	2125	40968	0	2270	2270	1	2280	2280
2255	2125	40972	0	2270	2270	1	2280	2280
1940	2065	40979	0	2215	2215	0	2225	2225
2075	2110	40985	0	2245	2245	0	2255	2255
490	2040	40992	0	2205	2205	0	2215	2215
495	2075	40998	0	2205	2205	0	2215	2215
670	2265	41014	0	2305	2305	0	2295	2295
675	2310	41020	0	2300	2300	0	2290	2290
780	2320	41028	0	2345	2345	0	2335	2335
965	2395	41035	0	2425	2425	0	2415	2415
1110	2435	41042	0	2450	2450	0	2430	2430

1275	2555	41048	0	2500	2500	0	2490	2490
1415	2515	41055	0	2545	2550	0	2540	2540
2020	2555	41063	0	2595	2595	0	2580	2580
2585	2645	41072	0	2665	2665	0	2695	2695
2755	2695	41077	0	2715	2715	0	2710	2710
2800	2740	41083	0	2745	2745	0	2740	2740
2800	2740	41089	0	2745	2745	0	2740	2740
2905	2843	41098	0	2870	2868	0	2865	2868
2726	2755	41104	0	2803	2801	0	2788	2788
2780	2775	41111	0	2838	2843	0	2827	2828
2740	2700	41119	0	2793	2954	0	2783	2778
2669	2709	41124	0	2754	2746	0	2739	2735
2410	1845	41132	0	2651	2652	0	1767	1032
2380	1741	41139	0	1931	2026	0	1866	1010
2420	2550	41146	0	2565	2565	0	2560	2560
2545	2530	41160	0	2605	2605	0	2595	2595
2460	2510	41167	0	2200	1070	0	1930	1020
2290	2535	41175	0	2575	2575	0	2565	2565
2290	2535	41180	0	2575	2575	0	2565	2565
2255	2570	41188	0	2610	2610	0	2600	2600
2260	2660	41195	0	2690	2690	0	2690	2690
2250	2700	41202	0	2740	2740	0	2700	2700
2765	2785	41208	0	2810	2810	0	2805	2805
2770	2800	41216	0	2810	2810	0	2810	2810
2795	2775	41223	0	2810	2810	0	2800	2800
2795	2765	41230	0	2800	2800	0	2800	2800
2785	2735	41251	0	2805	2805	0	2795	2795
2760	2740	41258	0	2805	2805	0	2795	2795
0	0	41273	0	0	0	0	0	0
2615	1820	41280	0	2630	2630	0	1755	1025
2425	1655	41287	0	2505	2505	0	1850	1180
2175	2010	41294	0	2375	2375	0	1890	2120
2090	1320	41308	0	2125	2125	0	1390	680
2080	1320	41313	0	2120	2120	0	1380	680
1930	1795	41320	0	2035	2035	0	1335	650
1935	1240	41328	0	1975	1975	0	1320	665
1875	755	41335	0	1910	1910	0	1265	630
1860	1740	41342	0	1905	1905	0	1670	640

1860	1745	41349	0	1905	1905	0	1670	640
1770	1830	41356	0	715	515	0	1925	1925
1815	1830	41362	0	1910	1910	0	1920	1920
1870	1850	41370	0	1945	1945	0	1950	1950
485	1815	41377	0	1950	1950	0	1945	1945
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490	1900	41391	0	1985	1985	0	1990	1990
480	2030	41398	0	2080	2080	0	2080	2080
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485	2160	41411	0	2215	2215	0	2215	2215
480	2335	41426	0	2395	2395	0	2390	2390
520	2460	41432	0	2445	2445	0	2455	2455
893	2534	41441	0	2523	2525	0	2518	2518
1282	2592	41448	0	2590	2590	0	2580	2580
1609	2510	41454	0	2547	2545	0	2098	2428
1975	2485	41461	0	2510	2510	0	2515	2515
470	2475	41468	0	2545	2545	0	2550	2550
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2580	2635	41510	0	2665	2665	0	2660	2660
2525	1300	41517	0	2630	2630	0	2400	2565
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2405	910	41622	0	1210	1425	0	1460	740
2066	762	41630	0	1988	1990	0	1308	640
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1580	670	41650	0	1635	1635	0	1100	585
495	1470	41657	3	670	860	0	1100	585
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525	645	41671	0	655	805	0	1040	575
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499	909	41727	0	872	869	0	858	858
500	920	41733	0	880	880	0	870	870
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485	2276	41980	0	2488	2493	0	2497	2497
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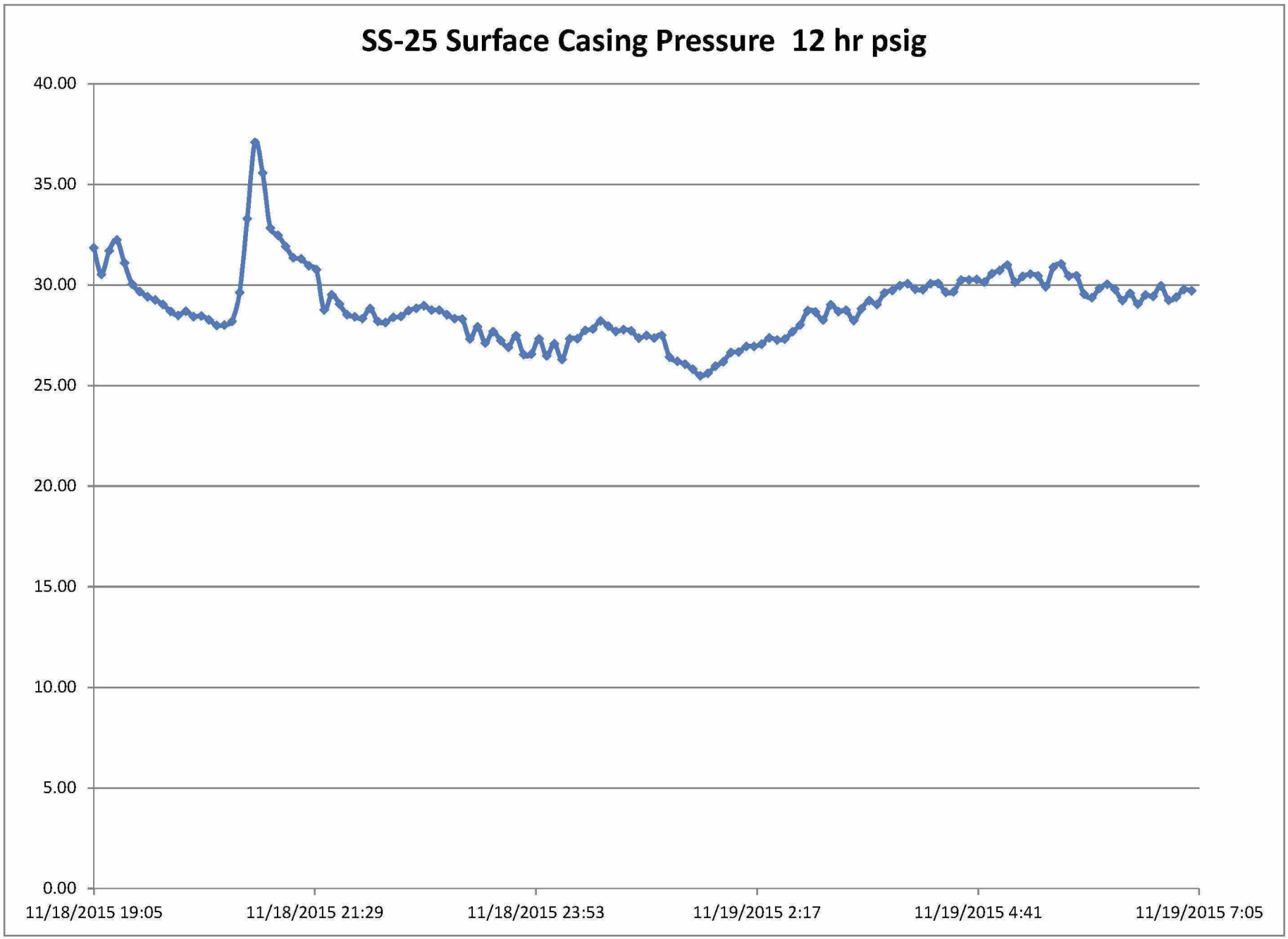
CHAPTER 8
EXHIBITS

Confidential and Protected Materials Pursuant to
PUC Section 583, GO 66-D, and D.17-09-023

Message

From: [redacted]
Sent: 11/13/2015 11:00:19 PM

SEMPRA: ****OPEN MCR*** Per Incident commander Glenn La Fever. During the repair process to mitigate the Leak at the well head in Aliso Canyon, oil was extracted and was vented into the atmosphere. There is an oily mist that may potentially be moving into the Porter Ranch area. Customer Service Field, Distribution and Meter Reading employees who are or may be headed to work in the area have been given instructions to avoid the Porter Ranch area until further notice. The Customer Contact Center has been notified. If an A-1 is issued in the area, CSF employees are to take extreme caution when working the order. FROM:sstrong 818-701-2505 SENT: @15:00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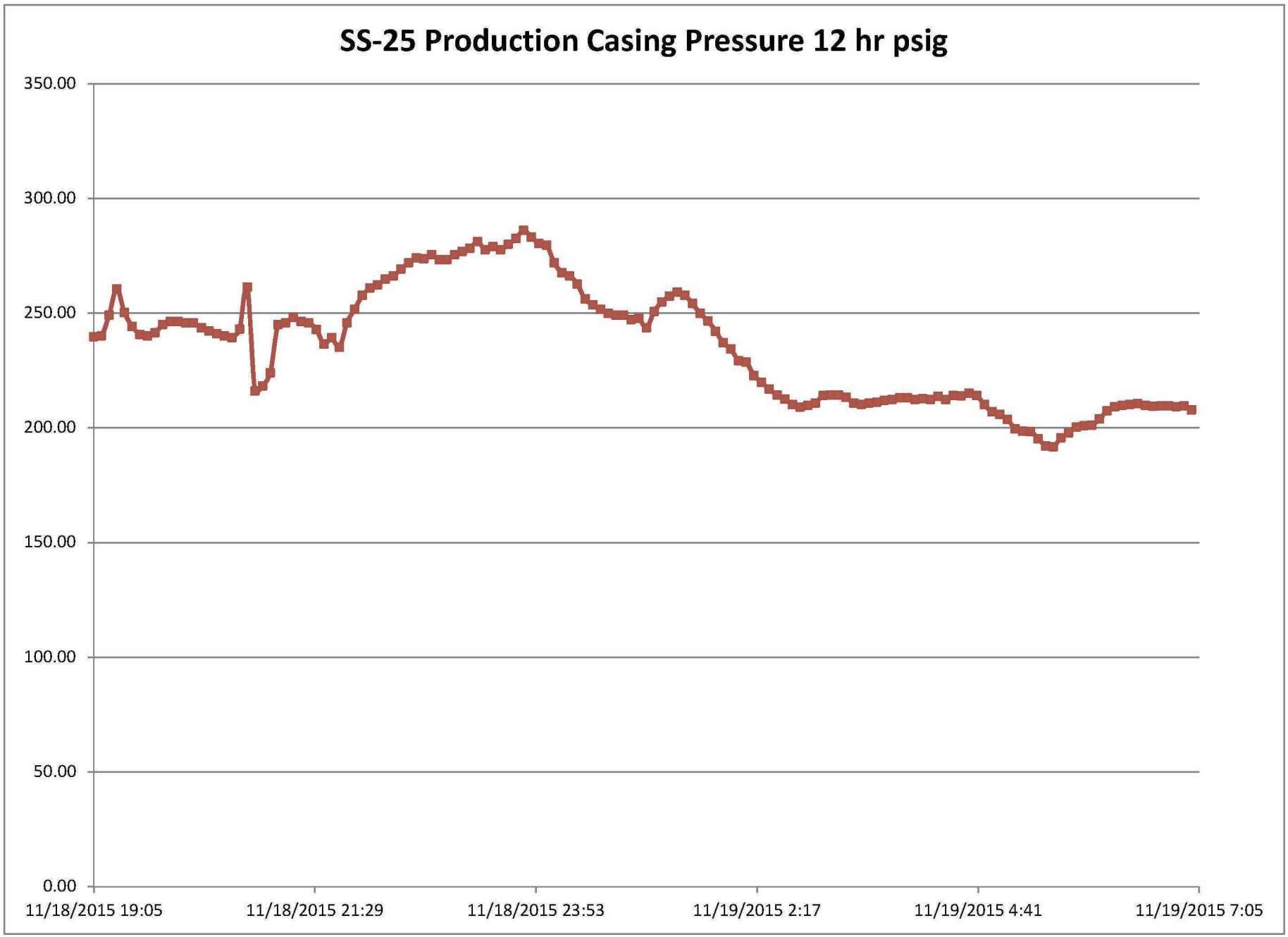
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
11/18/2015 19:05
11/18/2015 21:29
11/18/2015 23:53
11/19/2015 2:17
11/19/2015 4:41
11/19/2015 7:05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50.00
0.00
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11/18/2015 21:29
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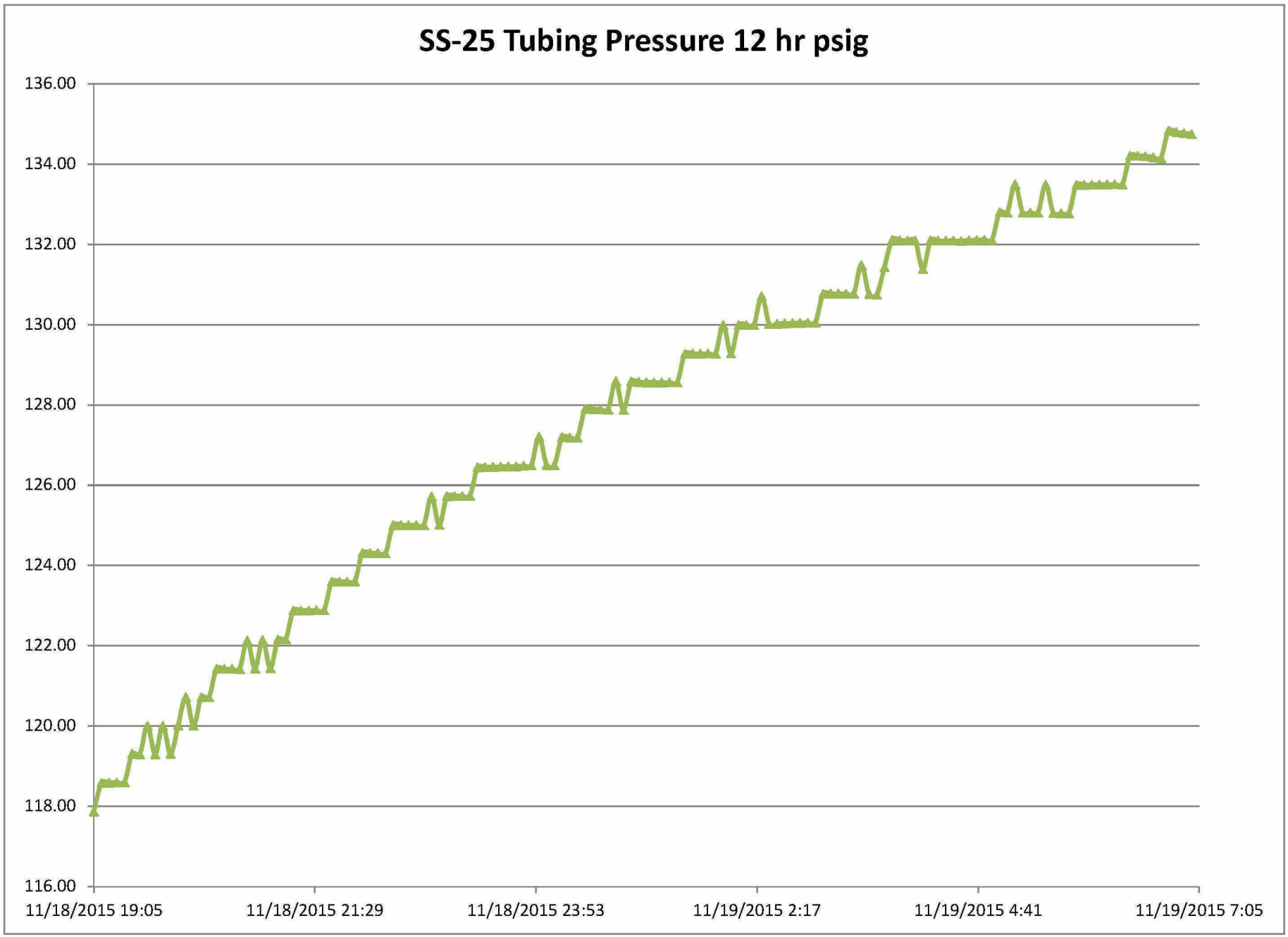
11/19/2015 4:41
11/19/2015 7:05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134.00
132.00
130.00
128.00
126.00
124.00
122.00
120.00
118.00
116.00
11/18/2015 19:05
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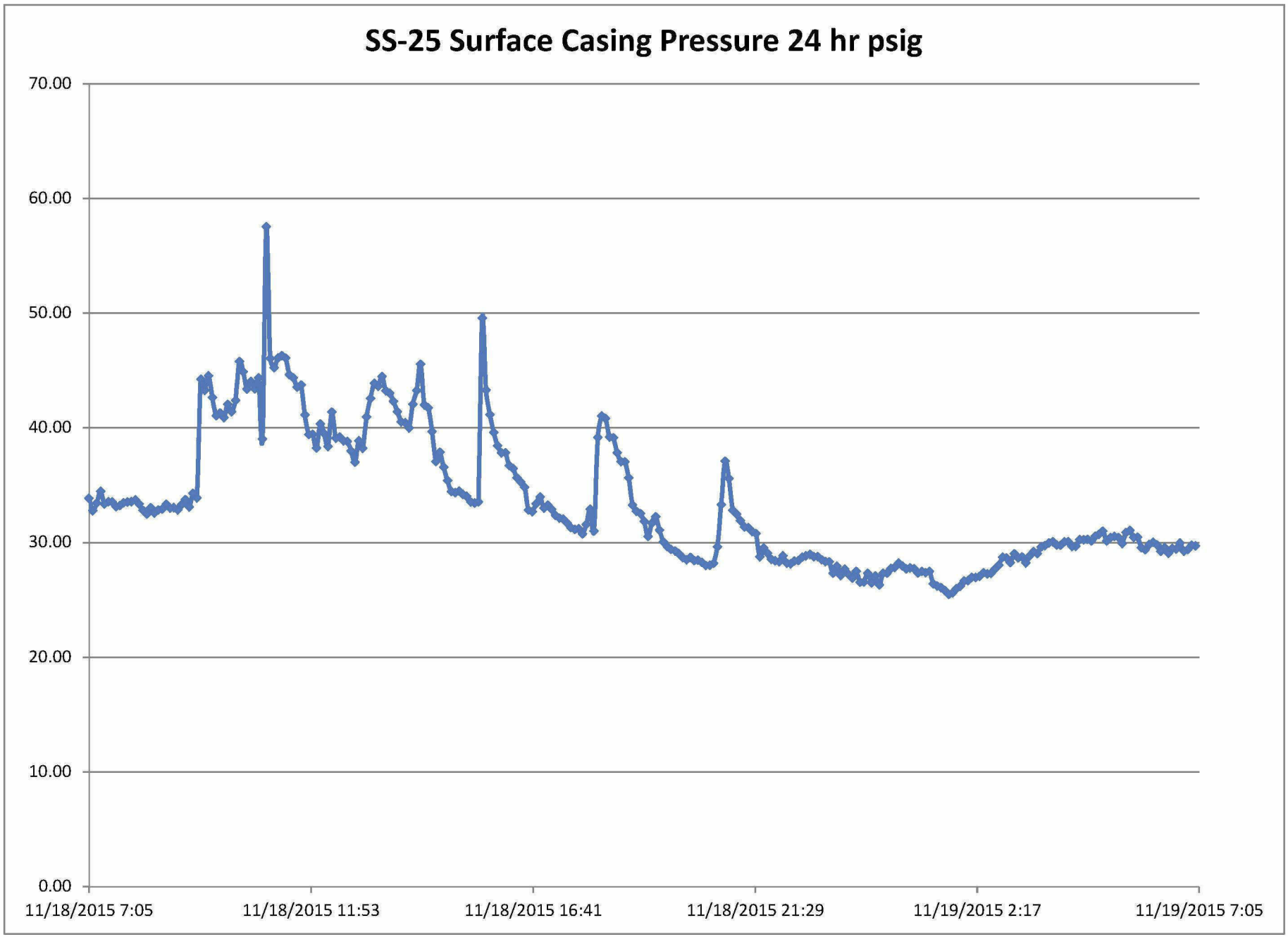
11/19/2015 7:05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60.00
50.00
40.00
30.00
20.00
10.00
0.00
11/18/2015 7:05
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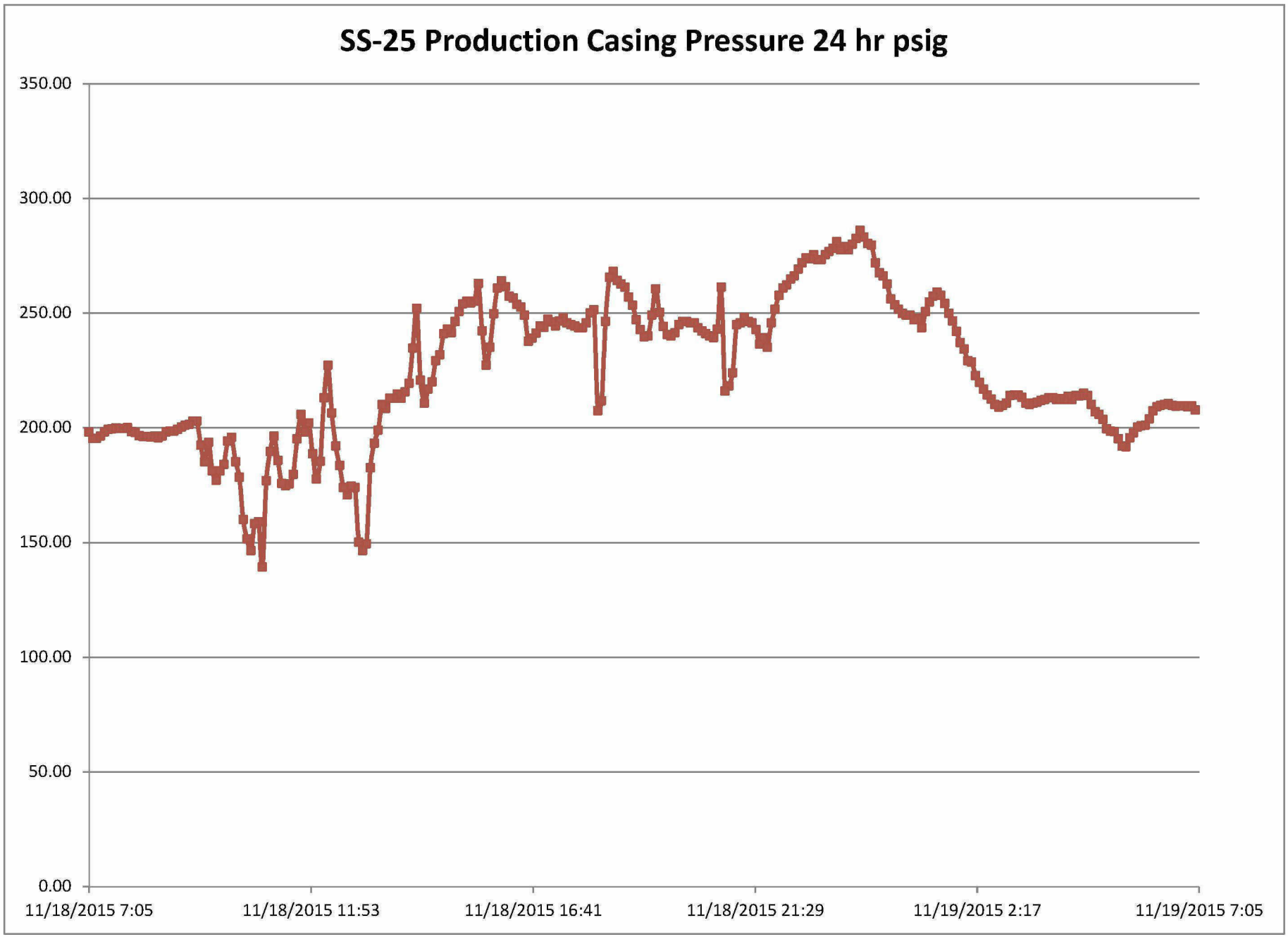
11/19/2015 7:05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300.00
250.00
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50.00
0.00
11/18/2015 7:05
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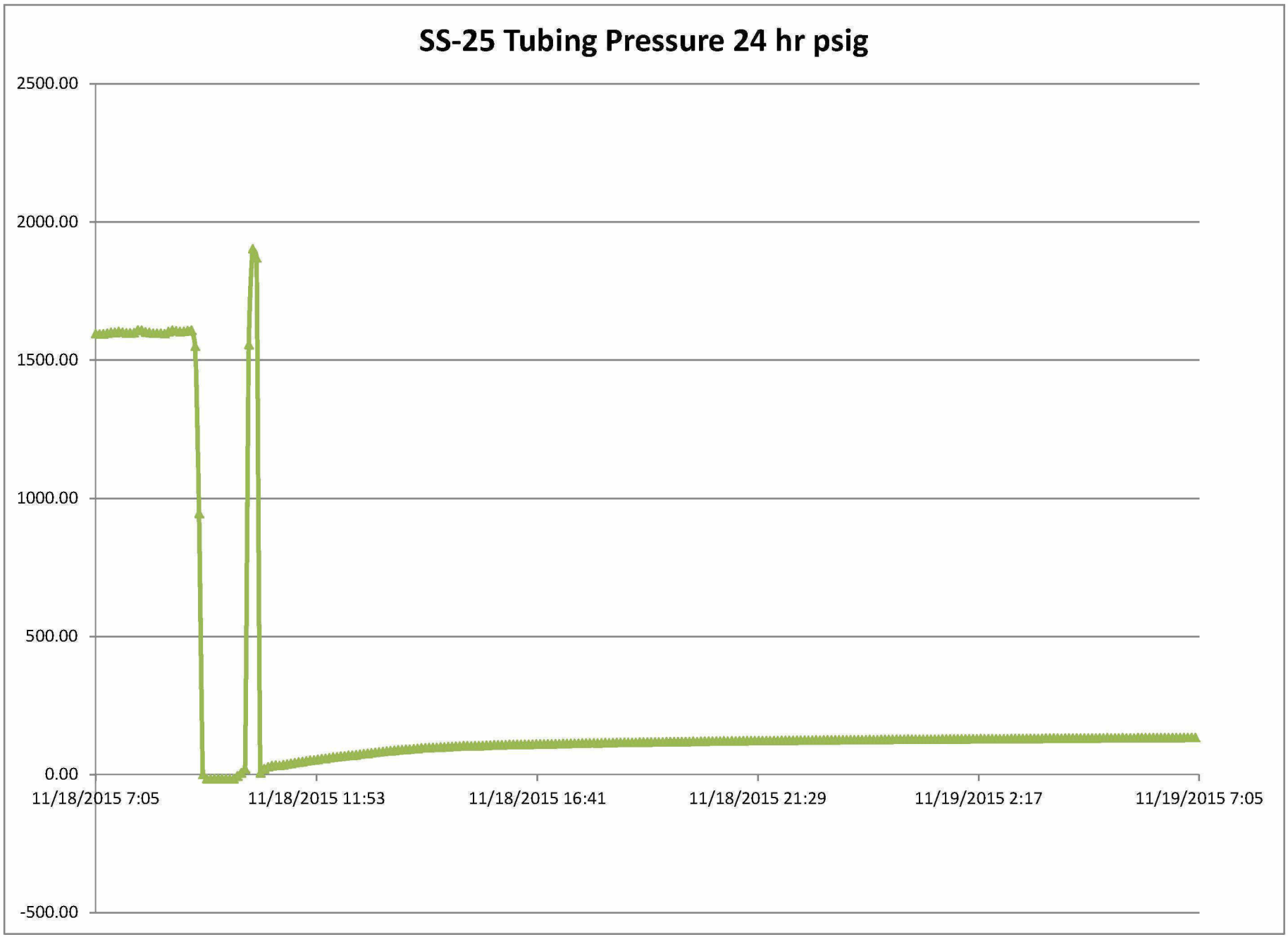
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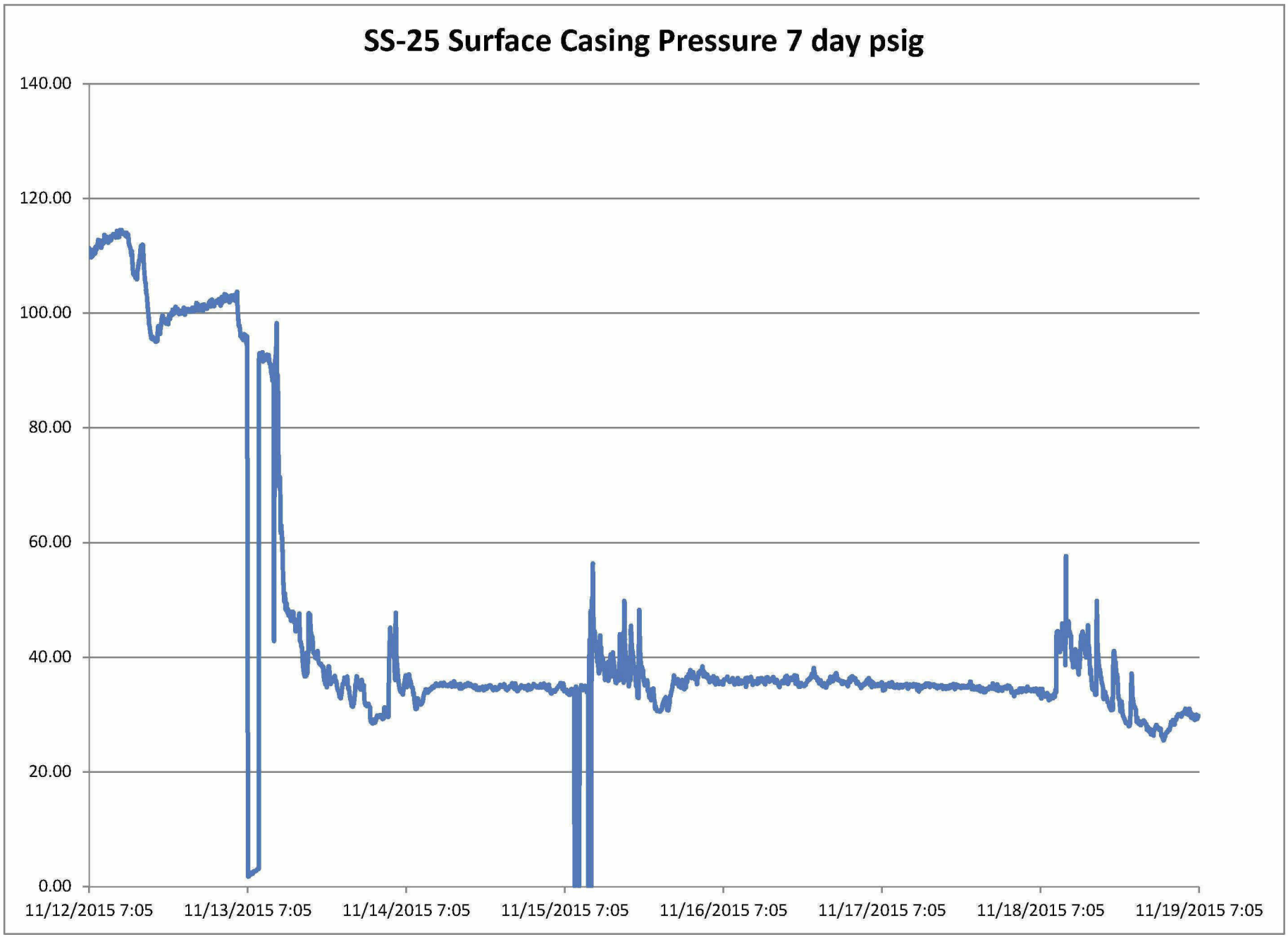
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20.00
0.00
11/12/2015 7:05
11/13/2015 7:05
11/14/2015 7:05
11/15/2015 7:05
11/16/2015 7:05
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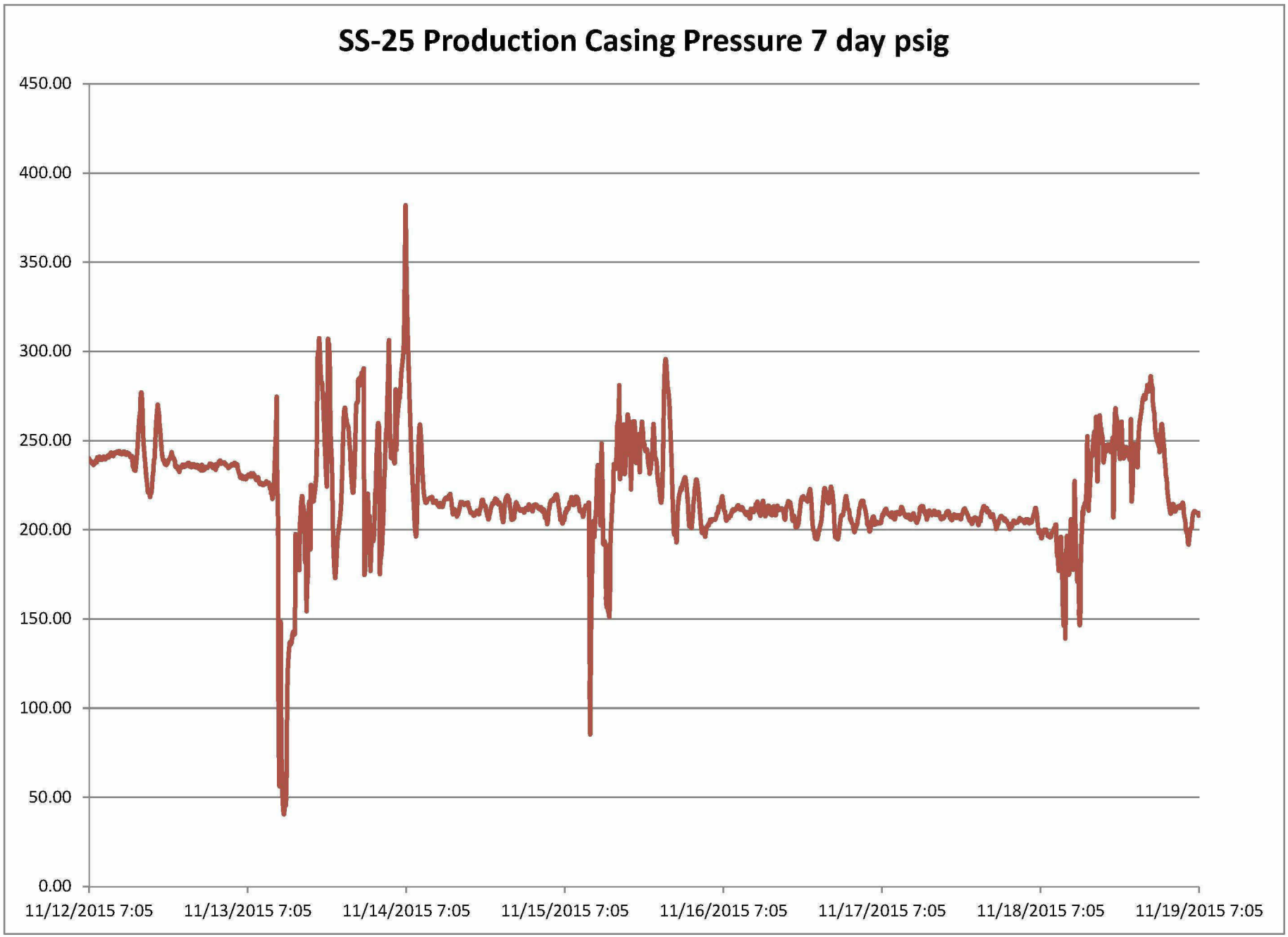
11/18/2015 7:05
11/19/2015 7:05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200.00
150.00
100.00
50.00
0.00
11/12/2015 7:05
11/13/2015 7:05
11/14/2015 7:05
11/15/2015 7:05
11/16/2015 7:05
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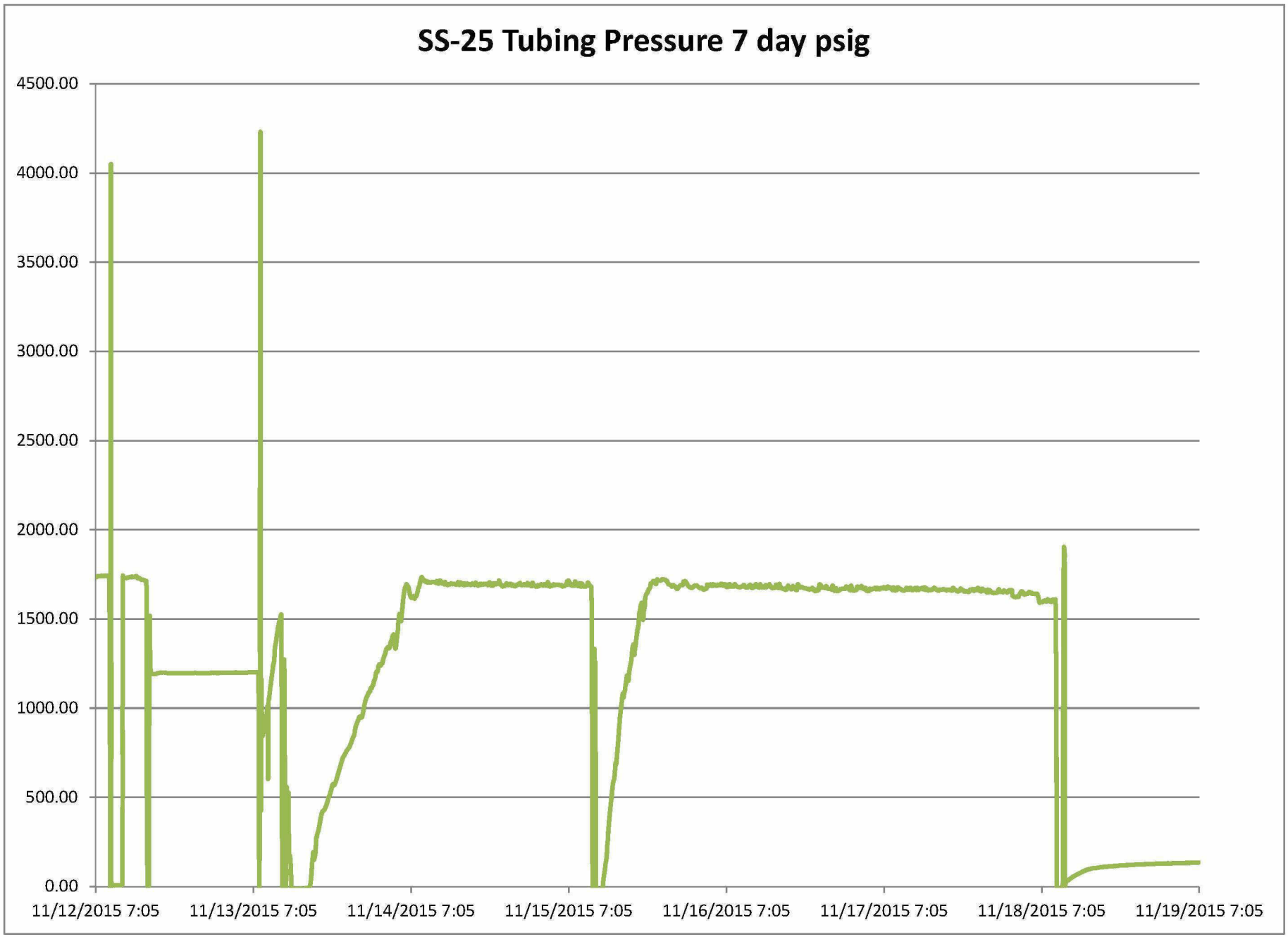
11/18/2015 7:05
11/19/2015 7:05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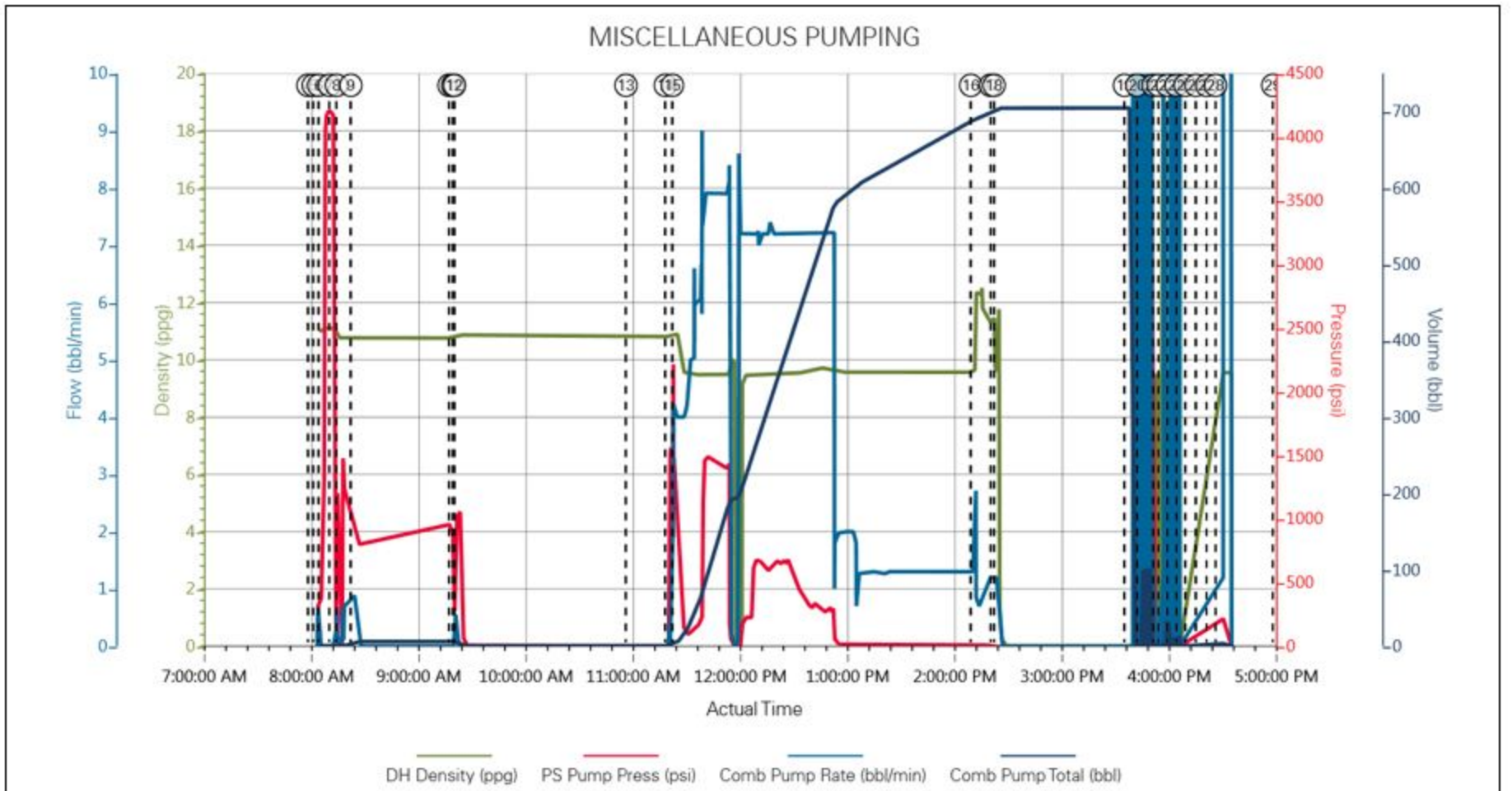
4500.00
4000.00
3500.00
3000.00
2500.00
2000.00
1500.00
1000.00
500.00
0.00
11/12/2015 7:05
11/13/2015 7:05
11/14/2015 7:05
11/15/2015 7:05
11/16/2015 7:05
11/17/2015 7:05
11/18/2015 7:05
11/19/2015 7:05

HALLIBURTON

Customer: SOUTHERN CALIFORNIA GAS CO EBUS
Job: MISCELLANOUES PUMPING
Case: Case 1 | SO#: 111315



SED SUR_REPLY_002187

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

7047 W. Greens Rd.
Houston, TX. 77066
281-931-8884

This is an estimate only for the date listed on this sheet. This is not an invoice.

Date:	13-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	20
Customer Name:	Southern California Gas Company	County:	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328	State:	California		
	Northridge, CA, 91326	Country:	USA		
AFE #:		Well Location:	Aliso Canyon Storage Facility		
Customer Representative:		Well Type:	Gas		
Report Generated By:	Danny Walzel	Job Type:	Well Control		
Lease - Well #:	Standard Senson 25	Rig No:	N/A		

Description of Charges:	Level	Comments	Units	
Sr. Well Control Specialist	4	Danny Clayton	1	[redacted]
Well Control Specialist	4	James Kopecky	1	
Sr. Well Control Engineer	4	Danny Walzel	1	
HSE Specialist	4	Mike Baggett	1	
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	
Hotel		D.C./ D.W. / J.K. / M.B.	4	
Rental Car			1	
Rental Car			1	
Estimated Daily Total				

Well Summary

Standard Senson 25 has broached to surface with several fissures on pad site.
11-3/4" casing to 990 ft. 7" casing to 8,585 ft. 5-1/2" slotted liner to 8,745 ft. 2-7/8" tubing to 8,510 ft. Packer depth 8,468 ft.

Hour	Hour	Activity on Site
5:45	6:00	Traveled from hotel to location.
6:00	6:30	Performed site assessment. Took LEL readings. Cleared location to begin work. 2-7/8" - 1,202 psi. 7" - 229 psi.
		11-3/4" - 89 psi.
6:30	7:00	Attended morning safety/operations meeting. Discussed perforating tubing and pumping kill.
7:00	9:00	Installed targeted 90 on wellhead flowline. Stabbed lubricator. Tested to 300/4,000 psi. Test good. Equalized swab valve with
		1,200 psi. Opened swab valve. Tubing pressure 1,201 psi. Pumped 6 bbls of 10.8 ppg CaCl2. 2-7/8" - 908 psi. 7" - 229 psi.
		11-3/4" - 90 psi.
9:00	11:15	RIH with tubing punch. Tagged EZSV at 8,402 ft. Perforated tubing 8,387 ft to 8,391 ft. Pulled out of hole. Laid down lubricator.
11:15	14:00	2-7/8" - 1,526 psi. 7" - 253 psi. 11-3/4" - 89 psi. Held PJSM. Pumped 10 9.4 ppg polymer pill. Began displacing with 9.4 ppg
		CaCl2. After displacing tubing volume opened choke on 7" casing. Pump rate 6 bpm. PP - 166 psi. After 80 bbls displaced
		observed increased gas flow and liquid from fissures. Pump rate 8.0 bpm. PP - 1,500 psi. Continued pumping at 8.0
		bpm. After 185 bbls pumped. Pump pressure - 1,400 psi. Pony motor went down. 7" - 45 psi. 11-3/4" - 45 psi. Pumps offline.
		Brought pumps online at 7 bpm. Pump pressure 0 psi. After 210 bbs pumped. Pump pressure 203 psi. After 320 bbls pumped
		PP - 634 psi. Brine, oil, and gas flowing from fissures on pad. After 693 bbls pumped 10 bbls 9.4 ppg polymer pill.
		Displaced into tubing with 3 bbls. Shut down. Tubing pressure 0 psi. 7" - 192 psi. 11-3/4" - 92 psi.
14:00	17:00	Lined up to pump down 2-7/8" x 7" annulus. Pumped junk shot. After 5 bbls pumped observed brine from fissures. Continued
		pumping junk shots. Shut down. 2-7/8" - 278 psi. 7" - 293 psi. 11-3/4" - 42 psi.
17:00	17:45	Attended end of the day meeting. Discussed pumping junk shot to plug hole in 7" casing and pumping barite pill
		out of perfs in tubing.
17:45	18:00	Traveled to hotel.

Projected Operations

Pump barite pill.

Approvals

Signature Customer Representative	Print Name	Date

Signature Boots and Coots Representative	Print Name	Date
	Danny Walzel	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Danny Clayton	11.75	0.5			
Danny Walzel	11.75	0.5			
James Kopecky	11.75	0.5			
Mike Baggett	11.75	0.5			
				Total Man-hours for Noted Date:	49

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Message

From: Van de Putte, Todd [/O=ENOVA/OU=SDGE/CN=RECIPIENTS/CN=TVANDEPU]
Sent: 11/13/2015 5:27:08 PM
To: 'John.geroche@conservation.ca.gov' [John.geroche@conservation.ca.gov]
CC: Bruce Hesson (bruce.hesson@conservation.ca.gov) [bruce.hesson@conservation.ca.gov]; Cho, Jimmie I [/O=ENOVA/OU=SDGE/cn=Recipients/cn=JICho]; Lane, Bret [/o=ENOVA/ou=SOCAL/cn=Recipients/cn=TPJBL]
Subject: So Cal Gas - Aliso Canyon - Standard Sesnon 25 (API#03700776) - Preliminary DRAFT Shallow Gas Recovery Outline

Hi John,

Per the meeting with Bruce and your folks at the Standard Sesnon 25 well site today (11-13-15) the following is the requested preliminary draft outline of the plan to recover the residual shallow gas as a result of the Standard Sesnon 25 well leak at the Aliso Canyon Field, after the Standard Sesnon 25 well has been secured. The general work plan outline will likely consist of the following activities:

- Assess the Standard Sesnon 25 well site for equipment stability and make improvements to the well site as deemed necessary, so that a workover rig may work on the wellsite to completely cement/abandon or utilize the well for shallow gas recovery per the DOGGR permitting requirements.
- Collect and review the local Aliso Canyon Field and nearby Standard Sesnon-25 site geologic data, and other well survey data to assess the possible areal extent of the shallow gas impacted area in the Standard Sesnon-25 area of the Aliso Canyon field.
- Review and assess the existing Gas Company wells near the Standard Sesnon 25 wellsite to determine which wells may be viable candidates for shallow gas recovery in the vicinity of the Standard Sesnon-25 well site.
- Select approximately 3-4 of the wells determined to be viable for gas recovery, acquire the DOGGR Notice of Intent to Rework permits and convert the existing wells in preparation to recover the shallow gas.
- Design and install a temporary shallow gas collection system for the shallow gas recovery to the Gas Company system.
- Produce and meter the wells designated as shallow gas recovery wells to the Gas Company system.
- Perform ongoing monitoring and sampling to verify the composition of the recovered shallow gas.

This general outline is a preliminary draft and evolving work product and will be modified as more information about the SS-25 well, wellsite and other onsite data are collected.

Todd R. Van de Putte

Drilling Manager

Confidential and Protected Materials Pursuant to PUC Section 583, GO 66-D, and D.17-09-023

Storage Operations/Engineering

Southern California Gas Company

[redacted]

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Message

From: Brandy, Carla L. [CBrandy@semprautilities.com]
Sent: 11/13/2015 5:30:39 PM
To: Lane, Bret [JLane@semprautilities.com]; Van de Putte, Todd [TVandePutte@semprautilities.com]
Subject: FW: OPEN MCR

Elaine got this as a text at 3:00 but seems strange neither Todd or I got it. Just want to make sure this isn't something fishy especially since it isn't even accurate. Brine is not oil.

Carla Brandy
Support Services Supervisor
SoCalGas

From: Ysabal, Elaine
Sent: 11/13/2015 5:26 PM
To: Van de Putte, Todd
Cc: Brandy, Carla L.
Subject: OPEN MCR

1/5 INCIDENT COMMANDER GLENN LAFEVERS. DURING THE REPAIR PROCESS TO MITIGATE THE LEAK AT THE HEAD IN ALISO CANYON OIL WAS EXTRACTED AND WAS VENTED INTO THE ATMOSPHERE. THERE IS AN OILY MIST THAT MAY POTENTIALLY BE MOVING INTO THE PORTER RANCH AREA. CUSTOMER SERVICE FILED, DISTRIBUTION AND METER READING EMPLOYEES WHO ARE OR MAY BE HEADED TO WORK IN THE AREA HAVE BEEN GIVEN INSTRUCTIONS TO AVOID THE PORTER RANCH AREA UNTIL FUTURE NOTICE. THE CUSTOMER SERVICE CENTER HAS BEEN NOTIFIED. IF AN A-1 IS ISSUED IN THE AREA, CSF EMPLOYEES ARE TO TAKE EXTREME CAUTION WHEN WORKING THE ORDER

Ysabal, Elaine
Southern California Gas Co.
Sr Wk Order Anlys Clerk-6
Storage
(310) 578-2692 Work
[redacted]
EYsabal@semprautilities.com
831 Howard Ave
Montebello 90640-2598

Message

From: McGurk, Scott@DOC [Scott.McGurk@conservation.ca.gov]
Sent: 1/7/2016 11:14:12 AM
To: Van de Putte, Todd [/O=ENOVA/OU=SDGE/cn=Recipients/cn=TVandePu]
Subject: Printoff file
Attachments: STANDARD SESNON 25 Chronology Summary.docx

Thanks

Scott McGurk

This email originated outside of Sempra Energy. Be cautious of attachments, web links, or requests for information.

"Standard Sesnon" 25 Chronology - Summary

- **October 23, 2015** At ±1600 a SCG representative called the DOGGR Ventura office (formally District 2). SCG stated that the Standard Sesnon 25 well had suffered a well head leak on the surface, and that mitigation procedures would begin the next day at daybreak. The well gave no indication of a serious problem.
- **October 24, 2015:** SCG called the DOGGR Ventura office and updated the on-call engineer about the status of the leaking well head after the first well control attempt.
- **October 26, 2015:** SCG contacted The DOGGR Ventura office to inform them that Boots and Coots (international well control experts) had been called out to Aliso Canyon, since normal well control operations were not effective. SCG believed that the well had formed methane ices in the tubing string. B&C performed an assessment of the situation. The DOGGR scheduled a field meeting with SCG for the next morning.
- **October 27, 2015:** The DOGGR inspected the leaking well, noting surface cracks leaking gas. Gas was also escaping out the west side of the hill just next to the well. DOGGR management was informed that the situation was more complicated and serious than was previously reported. The DOGGR recommended daily visits to Aliso Canyon and updates from the operator until the situation was resolved.
- **October 28, 2015:** The well head was resealed and the well was produced to try to reduce gas leaking at surface. Special well equipment was assembled to determine where ice was plugging the tubing and perhaps causing a leak. The cause of the leak was still not known.
- **October 29, 2015**: SCG confirmed the well tubing was blocked, perhaps by ices.
- **October 30, 2015**: The well gave no indication that a more serious issue was present. SCG made plans for special equipment to be brought from Louisiana, should it be required.
- **October 31-November 1, 2015:** SCG prepared the site for operations and began moving in equipment. A special low temperature mud was formulated for a second well control attempt, because of ices in the well tubing.
- **November 2, 2015:** More equipment arrived at the site for the second well control attempt. **November 3 - 4, 2015, 2015:** The special well control equipment was setup. The DOGGR was onsite during operations. SCG sent the DOGGR a "Notice of Intent" for the second well control attempt and was issued a permit.
- **November 5, 2015:** Well control equipment was tested and approved.
- **November 6, 2015:** The second well control attempt was made, during which the ices were cleared from the tubing. The injected heavy, low temperature mud was supposed to over-balance the gas at the bottom of the well, and stop the leak. The attempt failed.
- **November 7 - 12, 2015:** Wireline logs were run to gather additional information. The logs indicated extreme cold and gas flow noise from about 350 to 990 feet below the surface. This is the suspected location of the leak. Field wide withdrawal of gas began on 11/11/2015, to reduce the pressure in the gas storage reservoir.
- **November 13, 2015:** The third well control attempt was made, but with much more heavy mud. During the attempt, a ground surface vent opened up about 20 feet to the north of the well, emitting a high volume of gas. All other gas leaks around the well ceased.

- **November 14 – 17, 2015:** More wireline logs were run for diagnostics. The process for the first relief well was begun. The DOGGR now had a representative onsite every day, all day. Daily reports were sent to the DOGGR HQ and the governor's office.
- **November 18, 2015:** A fourth well control attempt was made with a large amount of heavy mud and barite. It was not successful.
- **November 19 – 23, 2015:** Some equipment was removed from the site. Several days of work were lost due to weather conditions. The fifth well control attempt was designed. On November 23 work began on the first relief well, as permitted by the DOGGR.
- **November 24, 2015:** The fifth well control attempt was made and failed. For weather and safety reasons, the pumping equipment for this attempt had been moved to a site about 400 feet uphill and to the north. During this attempt, the ground to the north of the well suffered significant erosion, forming a deep vent.
- **November 25, 2015:** A sixth well control attempt was made and failed. Surface ground erosion increased.
- **November 26 - December 11, 2015:** The well site was monitored and cleaned up. The main focus was now drilling the first relief well and operations are running 24 hours a day. SCG put the leaking well on production starting December 7, to reduce the gas reservoir pressure and try to reduce the gas leak.
- **December 11, 2015**: AECom and Flour both made on site visits to create proposals for design, fabrication, and installation of systems to capture leaking gas. An attempt to install a special pipe for gas capture in the vent was not successful.
- **December 12, 2015:** SCG planed to start air sampling at the SS25 site shortly, to record gas emission variations over time.
- **December 13, 2015:** A seventh well control attempt is discussed. The first relief well work continues.
- **December 14, 2015:** Due to the dangerous wind conditions, Site 25 was shut down in the morning. AECom is working with B&C to build a bridge over the SS-25 wellhead, to span the surface erosion vent, allowing access to the well. SCG is rebuilding and strengthening the catch basins and culverts surrounding the Site 25 location in anticipation of heavier El Nino rains.
- **December 15, 2105:** The fabrication of the bridge continues. The first relief well drilling continues.
- **December 16, 2015:** Continue to clean up the SS25 site for the wellhead bridge installation. The bridge is 100 feet long, with a safety cage in the middle.
- **December 17, 2015:** SCG is finishing the bridge that will be installed across and over the SS25 wellhead and vent opening. Relief well drilling is at 2439 feet MD.
- **December 18, 2015:** The well access bridge construction continues.
- **December 19, 2015:** The well access bridge construction was completed and installed this afternoon on the SS 25 well.
- **December 20, 2015:** A wireline unit set into place on the SS 25 site for the relief well ranging run.
- **December 21, 2015:** Ranging is successful at about 4000 feet underground and the relief well is on track to intercept the leaking well.
- **December 22, 2015:** A seventh well control attempt was made and failed. Surface ground erosion increased.

- **December 23, 2015:** The SS25 site was assessed and cleanup began after the last well control attempt. SCG and B&C provided well control modeling data to the national labs supporting the well control efforts. The first relief well drilling continues.
- **December 24, 2015:** SCG is looking at possible incineration of captured leaking gas, if possible. SS25 site continues to be cleaned up. The first relief well drilling continues.
- **December 25, 2015:** Stainless steel meshes were installed over the vent, to reduce oil misting. AECom is re-working a preliminary design for a second bridge structure that would be used for oil mist capture, gas leak re-direction, and gas leak capture.
- **December 26, 2015:** The morning weather was clear, but with very strong winds from the north, which prevented safe operations at the SS25. The first relief well drilling continues.
- **December 27, 2015:** The morning weather was clear, but with very strong winds from the north, which prevented safe operations at the SS25. The whole gas field has been and continues to be on maximum withdraw, to reduce the gas reservoir pressure.
- **December 28, 2015:** An updated plug and abandonment program for the leaking well is discussed between SCG and the DOGGR. The first relief well drilling continues. Site preparation at the second relief well continues.
- **December 29, 2015:** The current mesh covering portions of the existing bridge appear to be working. Oil misting is noticeably reduced.
- **December 30, 2015: I**n preparation of future rain, one thousand sandbags are brought on location. Construction continues on the new mist abatement structures.
- **December 31, 2015:** The weather is not favorable today with winds gusting to 50-70 mph today. The two relief well efforts continue.
- **January 1, 2016:** The two relief well efforts continue.
- **January 2, 2016:** The two relief well efforts continue.
- **January 3, 2016:** A 60 foot section bridge with mist abatement mesh was installed by crane.
- **January 4, 2016:** Construction continues on two additional mist abatement structures. The governor visits the Aliso Canyon site.
- **January 5, 2016:** The two relief well efforts continue.
- **January 6, 2015:** The next oil mist abatement structure has been completed and is awaiting better weather conditions for installation. The two relief well efforts continue.

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED OCTOBER 23, 2018

SOCALGAS AMENDED RESPONSE 12(f) DATED DECEMBER 7, 2018

SoCalGas provides the following Amended Response to Question 12(f) of the CPUC-Safety and Enforcement Division's (CPUC-SED) data request dated October 23, 2018 related to the preliminary investigation regarding the Aliso Canyon Well Leak. The Response is based upon the best available, non-privileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas reserves the right to supplement, amend or correct the Response to the extent that it discovers additional responsive information.

SoCalGas submits this Response, while generally objecting to the extent the Request fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that the Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits this Response without conceding the relevance of the subject matter of the Request or Response. SoCalGas reserves the right to object to use of the Response, or information contained therein, in any dispute, matter or legal proceeding before any court, action. Finally, at the time of this Response, there are no pending oral data requests from the CPUC-SED to SoCalGas.

For this set of questions, please refer to the following timeline, which is a verbatim copy of what SED received from Southern California Gas Company (SoCalGas) in response to a question 1 of an SED Data Request to SoCalGas, dated November 13, 2015. For reference, a copy of the SED Data Request dated November 13, 2015 is Appendix A at the bottom of this data request. Questions are shown below this timeline stated from SoCalGas.

Aliso Canyon Natural Gas Leak November 15, 2015

DRAFT Timeline of Events*

- Friday, October 23 – Leak discovered, area made safe for well procedures, personnel and equipment mobilized; standard procedures began, internal notifications made.
- Saturday, October 24 – Standard procedures to stop leak not effective. SoCalGas brings in additional external expertise (Onyx & Halliburton). Regulatory notifications begin.
- Sunday, October 25 –Boots and Coots experts arrive, mobilize and begin evaluation. SoCalGas Media & Employee Communications team participating. Initial information regarding situation distributed to Customer Contact Center and others that night. Regulatory notifications expanded.
- Monday, October 26 – SoCalGas' Emergency Operations Center (EOC) activated in monitor mode to provide support to Aliso Canyon Incident Command team. Evaluations continue on the well. Customer message posted on socalgas.com. SoCalGas holds community meeting on Aliso Canyon Turbine Replacement Project. Provided information and answers about leak. Some customers expressed anger/frustration about the leak.
- Tuesday, October 27 – Crews conduct more diagnostics and tests. Letter sent to customers, posted, emailed to elected officials, HOAs. SoCalGas sets up dedicated email and phone hotline

for customer inquiries. Daily operational briefing set up for fire dept., emergency management and elected official Public Information Officers (PIO). Daily briefings with SCAQMD begin.

- Wednesday, October 28 – Crews use wireline rig for diagnostics. KTLA-TV Channel 5 and KABC-TV Channel 7 cover story. Customer letter hand delivered to 1,400 homes. Public information booth set up at Aliso Canyon facility and staffed from 10 a.m. and 5 p.m. daily.
- Thursday, October 29 – Multiple diagnostics, including initial "wireline" completed. Determined need for coiled tubing rig to be brought in. SoCalGas mails 8,100 letters to Porter Ranch area. SoCalGas creates Frequently Asked Questions fact sheet to help respond to customer questions.
- Friday, October 30 – Wireline equipment removed. Update letter, fact sheet emailed with message that odor will last. SoCalGas begins daily air sampling of multiple random sites on site and in community which is available on socalgas.com. KTLA-TV Channel 5 and KABC-TV Channel 7 cover protest at Aliso Canyon gates by local activists. Less than 20 attend rally. L.A. Daily News runs story and photos: "Natural Gas Leak Near Porter Ranch Lingers Nearly One Week Later."
- Saturday, October 31--Crews at SoCalGas work to prepare site for coiled tubing rig. SoCalGas delivers an update via letter to 1,400 homes closest to the facility.
- Sunday, November 1—Coiled tubing rig arrives in late afternoon. Adjacent wells killed (one Saturday & one Sunday) in preparation for work on SS-25.
- Monday, November 2 – Equipment unloaded, set up. SoCalGas mails letter to 8,100 customers. SoCalGas.com begins daily posting of updates; Posted air sampling results on socalgas.com.
- Tuesday, November 3 – Coiled tubing ready set up and connected, started pressure testing.
- Wednesday, November 4 – Coiled tubing pressure testing continues. SoCalGas briefs representatives from L.A. City and County Fire Departments, Hazmat, SCAQMD, DOGGR, L.A. County Department of Health and elected officials prior to the Porter Ranch Neighborhood Council meeting. SoCalGas speaks at the Porter Ranch Neighborhood Council. KTLA-TV Channel 5 and KCBS-TV Channel 2, KNX 1070 radio cover. Ken Bruno from CPUC SED visits with Jimmie Cho, SoCalGas Senior Vice President - Gas Operations and System Integrity, for tour of site. L.A. Daily News runs story: "Leaking Natural Gas Well Concerns Porter Ranch Residents."
- Thursday, Nov 5. – Coiled tubing pressure testing completed. L.A. Daily News reports on community meeting. Reporter Greg Wilcox visits Aliso Canyon main office area and interviews Jimmie Cho and Glenn La Fevers, SoCalGas' Storage Operations Manager. SoCalGas supplies photos to press. L.A. Daily News updates story: "Porter Ranch Residents Confront Officials Over Gas Leak."
- Friday, Nov. 6 – Coiled tubing rig begins breaking through the blockage and introducing fluid into the well. SoCalGas adds daily p.m. email briefing to local PIOs and elected officials.
- Saturday, Nov 7 - Second day of multi-day coiled tubing operation focuses on additional evaluation to guide the next step efforts to stop the flow of gas. Wireline rig set up. SoCalGas continues air monitoring. CARB/CEC fly plane over site to monitor methane. L.A. Daily News online article "New Attempt Made to Stop Gas Leak" featured on home page, reports on situation and includes photos coiled tubing rig and of SoCalGas execs meeting with LAFD officials on site. Posted on front page of weekend edition.
- Sunday Nov. 8 – Well-management experts continue multi-day evaluation. The focus was on continued evaluation of the well pipe conditions. Information from multiple diagnostic tests will

guide next steps to safely stop the flow of gas. L.A. Daily News runs column: "Leaking Well a Vexing Problem."

- Monday November 9 – Well-management experts continue multi-day evaluation. L.A. Daily News runs column: "Crews Make Progress in Repairing Gas Leak."
- November 10 - Additional well testing work performed. Hosted a site visit by representatives from state and local agencies and elected offices. Visitors were provided an overview of Aliso Canyon and Storage operations, and briefed on the current status of efforts to mitigate the leaking well.
- November 11 - Conducted data analysis, finalized strategy to stop the leak, and began preparing the site with the appropriate well-control equipment.
- November 12 - Successfully installed the "bridge plug" in the well tubing and continued to prepare the well site.
- November 13 - Tubing perforation activities performed and attempted stop the flow of gas by putting fluids down the well. During this operation, there was a release of a mist into the air. Based on the information at this time, it is not believed that these materials pose a threat to public health. Out of an abundance of caution, residents were notified to stay inside. Once determined that the mist was contained to our facility, residents were again notified that there was no reason to remain inside. Office of Emergency Services and National Response Center were notified of the release. They were updated at 3:14 pm that flow was reduced.
- November 14 – Evaluating the well conditions, preparing the site and determining the best strategy for our continued efforts to stop the flow of gas. Representatives from the L.A. County Health & Hazmat have inspected the site today and yesterday and observed our containment procedures. Collected samples of the mud and liquid from yesterday's release and having it analyzed and expect results tonight. At 1:05 pm OES and NRC were notified of release containment and minor additional release of crude oil at 4:30 am.

* Based on best available information at this time.

Question 12(f):

Regarding the statement "November 14-25, 2015 – Four top-well kill attempts were made by Boots and Coots by attempting to pump various types of fluid down the well."

With regards to the top well-kill attempts, what options, if any, were no longer feasible after the installation of the bridge plug in the tubing?

Response 12(f):

SoCalGas is unaware of all the options that may have been no longer feasible as a result of the installation of the bridge plug. However, SoCalGas understands that the installation of the bridge plug removed access to the tubing below where the bridge plug was set. In order to have performed a bullhead kill, the bridge plug would have had to be milled out.

CHAPTER 9
EXHIBITS

Response to Data Request

Response to SED Data Request-107

Prepared for:
Mr. Darryl Gruen
CPUC Legal Division

Purpose:
Blade response to the CPUC Data Request SED 107 related to SoCalGas data responses from Reply Testimony of Mr. Greg Healy on behalf of SoCalGas.

Date:
Jun. 25, 2020

Version:
1

Project Number:
N/A

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Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	Jun. 25, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

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1 Background

The Legal Division of the California Public Utilities Commission issued a Data Request to Blade Energy Partners (Blade) on June 19, 2020. Data Request No: SED 107 is related the Preliminary Investigation of Southern California Gas Company's Aliso Canyon Storage Facility.

The CPUC questions (from file: "I1906016 SED Data Request 107 Final.pdf") are included verbatim followed by the Blade responses to the questions.

The questions are related to the document titled: *Chapter IX, Prepared Reply Testimony of Greg Healy on behalf of Southern California Gas Company (U 904 G)* (file name: "9_Ch. IX - Healy (A Final).pdf").

2 Questions and Responses

Please refer to the following passage in the testimony of Mr. Greg Healy, which is provided as an attachment to this Data Request for reference.

SoCalGas' February and March 2019 supplemental responses to Blade's data requests were provided at Blade's specific request, so that Blade had the most complete records and to allow it to complete its commissioned root cause analysis. In about January 2019, Blade and SoCalGas had ongoing discussions (including at an in-person meeting) regarding whether Blade had been provided with the entire universe of documents that could inform its RCA investigation, including documents and data that had not specifically been asked for in a written data request.

As noted in the written supplemental responses themselves, the process chosen for production does not indicate that SoCalGas' prior responses to these four data requests were incomplete; rather, tying the documents to formal data requests was simply a means to keep track of the documents provided to Blade, which, over the course of Blade's 3+ year investigation, were significant. The prior responses provided to the data requests were already complete.

SOCALGAS' SUPPLEMENTAL RESPONSES 1 DID NOT SUBSTANTIALLY IMPACT BLADE'S RCA REPORT.

With these passages in mind, please answer:

2.1 Question 1

1. Did SoCalGas' February or March 2019 supplemental responses to Blade's data requests provide information that was responsive to a data request that Blade issued on January 31, 2016 as part of its Root Cause Analysis?

   For each answer of yes, please also answer:

   a. Did Blade use the information in the February or March 2019 supplemental responses to:

      i. Confirm any facts or conclusions in its Root Cause Analysis or Supporting Reports?

      ii. Change any facts or conclusions in its Root Cause Analysis or Supporting Reports?

2.1.1 Blade Response

The data request from January 31, 2016 was fulfilled over time in 2016 and 2017. The data request was also fulfilled during the meetings with SoCalGas personnel on February 8, 2016 and August 24, 2018.

The data provided in February/March 2019 was related to wells SS-25, SS-25A and SS-25B. The bulk of the data had already been provided previously in 2016 and 2017. There was minimal new data provided during February/March 2019. Blade did conduct a detailed review of the supplemental responses for information to confirm existing data and to check for new data that may further inform or change the RCA conclusions.

The supplemental responses were consistent with the data already provided and consequently confirmed our interpretation.

The supplemental responses did not change any of the RCA conclusions.

SED SUR_REPLY_002204

2.2 Question 2

2. Did SoCalGas' February or March 2019 supplemental responses to Blade's data requests provide information that was responsive to a data request that Blade issued on February 19, 2016 as part of its Root Cause Analysis?

   For each answer of yes, please also answer:

   a. Did Blade use the information in the February or March 2019 supplemental responses to:

      i. Confirm any facts or conclusions in its Root Cause Analysis or Supporting Reports?

      ii. Change any facts or conclusions in its Root Cause Analysis or Supporting Reports?

2.2.1 Blade Response

The data request from February 19, 2016 was fulfilled over time in 2016 and 2017. The data request was also fulfilled during the meetings with SoCalGas personnel on February 8, 2016 and August 24, 2018.

The data provided in February/March 2019 was related to wells SS-25, SS-25A and SS-25B. The bulk of the data had already been provided previously in 2016 and 2017. There was minimal new data provided during February/March 2019. Blade did conduct a detailed review of the supplemental responses for information to confirm existing data and to check for new data that may further inform or change the RCA conclusions.

The supplemental responses were consistent with the data already provided and consequently confirmed our interpretation.

The supplemental responses did not change any of the RCA conclusions.

2.3 Question 3

3. Did SoCalGas' February or March 2019 supplemental responses to Blade's data requests provide information that was responsive to a data request that Blade issued on April 7, 2016 as part of its Root Cause Analysis?

   For each answer of yes, please also answer:

   a. Did Blade use the information in the February or March 2019 supplemental responses to:

      i. Confirm any facts or conclusions in its Root Cause Analysis or Supporting Reports?

      ii. Change any facts or conclusions in its Root Cause Analysis or Supporting Reports?

2.3.1 Blade Response

The data request from April 7, 2016 was fulfilled over time in 2016 and 2017. The data request was also fulfilled during the meetings with SoCalGas personnel on February 8, 2016 and August 24, 2018.

The data provided in February/March 2019 was related to wells SS-25, SS-25A and SS-25B. The bulk of the data had already been provided previously in 2016 and 2017. There was minimal new data provided during February/March 2019. Blade did conduct a detailed review of the supplemental

responses for information to confirm existing data and to check for new data that may further inform or change the RCA conclusions.

The supplemental responses were consistent with the data already provided and consequently confirmed our interpretation.

The supplemental responses did not change any of the RCA conclusions.

DOC #	Prod Beg CPUC	FROM	TO	CC	BCC	DATE	DESCRIPTION	PRIVILEGE BASIS
1		Nancy.Renteria@LW.com	lportillo@boots-coots.com	Michael.Romey@LW.com; La Fevers, Glenn <GLaFevers@semprautilities.com>; Howes, Marlin E. <MHowes@semprautilities.com>		11/12/2015 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
2						11/12/2015 16:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
3		Lane, Bret <tpjbl@enova.com>	Danny Walzel <dwalzel@boots-coots.com>; Danny Clayton <dclayton@boots-coots.com>			11/17/2015 8:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
4						11/17/2015 8:05	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
5		Lane, Bret <tpjbl@enova.com>	Danny Clayton <dclayton@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>			11/22/2015 8:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
6						11/22/2015 8:43	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
7		Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Danny Walzel <dwalzel@boots-coots.com>		11/27/2015 6:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
8						11/27/2015 6:58	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
9		Cardiff, Steven G <SCardiff@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>	Danny Walzel <dwalzel@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		11/27/2015 18:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

10						11/27/2015 18:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
11						11/27/2015 18:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
12		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Danny Walzel <dwalzel@boots-coots.com>		11/30/2015 8:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
13		Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Danny Walzel <dwalzel@boots-coots.com>		11/30/2015 8:09	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
14		Lane, Bret <tpjbl@enova.com>	Danny Clayton <dclayton@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>			11/30/2015 8:10	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
15						11/30/2015 8:10	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
16		JLane@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Danny Walzel <dwalzel@boots-coots.com>		11/30/2015 8:14	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
17		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'John Hatteberg' <jhatteberg@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>		12/4/2015 9:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

18		Cardiff, Steven G <SCardiff@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Danny Walzel <dwalzel@boots-coots.com>	Baker, Phil E. <PBaker@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>		12/4/2015 10:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
19						12/4/2015 10:48	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
20						12/4/2015 10:48	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
21						12/4/2015 10:48	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
22		Lane, Bret <tpjbl@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>			12/7/2015 10:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
23		John Hatteberg <jhatteberg@boots-coots.com>	Sylvia Estrada <Sylvia.Estrada@halliburton.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Lane, Bret <JLane@semprautilities.com>; Leonardo Portillo <lportillo@boots-coots.com>; Monica Williamson <Monica.Williamson@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/7/2015 11:15	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
24						12/7/2015 11:15	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

25						12/7/2015 11:15	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
26						12/7/2015 11:15	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
27		Lane, Bret <JLane@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>; Sylvia Estrada <Sylvia.Estrada@halliburton.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Leonardo Portillo <lportillo@boots-coots.com>; Monica Williamson <Monica.Williamson@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/7/2015 11:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
28		Lane, Bret <JLane@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>; Sylvia Estrada <Sylvia.Estrada@halliburton.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Leonardo Portillo <lportillo@boots-coots.com>; Monica Williamson <Monica.Williamson@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/9/2015 5:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
29	AC_CPUC_0172250	Schwecke, Rodger <RSchwecke@semprautilities.com>	Danny Walzel <dwalzel@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/9/2015 6:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
30	AC_CPUC_0172252	Schwecke, Rodger <rschwecke@enova.com>	Danny Walzel <dwalzel@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/9/2015 6:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
31						12/9/2015 15:36	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

32						12/10/2015 11:27	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
33		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/11/2015 7:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
34		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>			12/11/2015 9:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
35		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			12/11/2015 12:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
36		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/11/2015 12:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
37						12/16/2015 5:43	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
38		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Alan.Gosse@Halliburton.com; Kevin.Bautista@halliburton.com; Kimberly.Barber@Halliburton.com; John Hatteberg <jhatteberg@boots-coots.com>; Wayne.Courville@boots-coots.com	De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Steve Cardiff <cardiffsr@gmail.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		12/18/2015 16:09	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
39						12/18/2015 16:09	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
40		Jim LaGrone <Jim.LaGrone@boots-coots.com>	donwshackelford@yahoo.com; Lane, Bret <JLane@semprautilities.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>			12/20/2015 13:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

41		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
42	AC_CPUC_0173646	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
43		John Hatteberg <jhatteberg@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
44		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
45	AC_CPUC_0173657	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
46		John Hatteberg <jhatteberg@boots-coots.com>	Wayne Courville <Wayne.Courville@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
47						12/21/2015 10:11	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
48						12/21/2015 10:11	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
49						12/21/2015 10:11	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
50						12/21/2015 10:11	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

51						12/21/2015 10:11	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
52						12/21/2015 10:11	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
53		Alan Gosse <Alan.Gosse@Halliburton.com>	Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Don Laribee <Don.Laribee@Halliburton.com>; Joseph Letzkus <Joseph.Letzkus@halliburton.com>; Kaleb Bean <Kaleb.Bean@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Lawrence Albitre <Larry.Albitre@Halliburton.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Eddy Hinds <Eddy.Hinds@Halliburton.com>	John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville <Wayne.Courville@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		12/21/2015 10:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
54		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			12/23/2015 17:52	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
55		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>			12/23/2015 17:52	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

56		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/28/2015 14:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
57		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/28/2015 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
58		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			12/28/2015 14:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
59	AC_CPUC_0174272	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			12/29/2015 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
60		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Bud Curtis <bcurtis@boots-coots.com>		1/3/2016 5:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
61						1/3/2016 5:42	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
62		JLane@semprautilities.com	Snyder, Hal <HSnyder@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/3/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
63						1/3/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

64						1/3/2016 8:53	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
65		Lane, Bret <tpjbl@enova.com>	Snyder, Hal <HSnyder@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/3/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
66						1/3/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
67						1/3/2016 8:54	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
68		Snyder, Hal <HSnyder@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		1/3/2016 8:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
69		Snyder, Hal <hsnyder@enova.com>	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		1/3/2016 8:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
70		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Arriola, Dennis <DArriola@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		1/5/2016 11:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
71						1/5/2016 11:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

72						1/5/2016 11:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
73						1/5/2016 11:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
74						1/5/2016 11:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
75		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'John Hatteberg' <jhatteberg@boots-coots.com>; 'Steve Cardiff' <cardiffsr@gmail.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>		1/6/2016 9:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
76		Rolando Gomez <Rolando.Gomez@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>			1/10/2016 13:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
77						1/10/2016 13:48	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
78		Lane, Bret <tpjbl@enova.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Don Shackelford (donwshackelford@yahoo.com); Arash Haghshenas <arash@boots-coots.com>			1/10/2016 16:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

79						1/10/2016 16:18	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
80		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		1/11/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
81						1/11/2016 10:35	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
82	AC_CPUC_0176003	Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			1/11/2016 12:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
83	AC_CPUC_0166905	Lane, Bret <tpjbl@enova.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Don Shackelford (donwshackelford@yahoo.com)			1/11/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

84		Rodriguez, Sonia <srodrig3@enova.com>	Navin, Neil <NNavin@semprautilities.com>; gregory.hisel@fire.lacounty.gov; Robert Salgado (rsalgado@dir.ca.gov); kcrook@arbinc.com; Mario.Tresierras@fire.lacounty.gov; McGurk, Scott@DOC <Scott.McGurk@conservation.ca.gov>; Efron, Mary Ann@DIR <MEfron@dir.ca.gov>; Kysar, Scott <SKysar@semprautilities.com>; matthewson.epuna@cpuc.ca.gov; william.mcmechen@aecom.com; Lawrence.Kathryn@epa.gov; MNazemi1@aqmd.gov; Cho, Jimmie I <JCho@semprautilities.com>; Cocker, Philip <Philip.Cocker@fire.lacounty.gov>; Cynthia.Ishikawa@dot.gov; Kenneth Crook	scott.walker@conservation.ca.gov; kenneth.bruno@cpuc.ca.gov; Kerns, Barry <BKerns@semprautilities.com>; Mike Baggett (mbaggett@boots-coots.com); ctrombettas@dir.ca.gov; Ibay, Isaac <IIbay@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; tdraper@arbinc.com; Schwecke, Rodger <RSchwecke@semprautilities.com>		1/14/2016 14:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
85						1/14/2016 14:29	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
86						1/14/2016 14:29	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

87						1/14/2016 14:29	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
88		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; stephen.yench@flour.com	Andrews, Larry J <LAndrews@semprautilities.com>		1/18/2016 13:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
89						1/26/2016 8:56	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
90						1/26/2016 8:56	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
91		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas <arash@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; John Hatteberg <jhatteberg@boots-			1/30/2016 17:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

92		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas <arash@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; John Hatteberg <jhatteberg@boots-			1/30/2016 17:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

93		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas <arash@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; John Hatteberg <jhatteberg@boots-			1/30/2016 17:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

94		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas <arash@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; John Hatteberg <jhatteberg@boots-			1/30/2016 17:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
95		Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/1/2016 16:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
96		Van de Putte, Todd <tvandepu@enova.com>	Don Shackelford <donwshackelford@yahoo.com>			2/1/2016 16:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

97	AC_CPUC_0169648	Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 6:03	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
98		Egbert, Thomas <tegbert@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	'arash@boots-coots.com'		2/4/2016 9:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
99						2/4/2016 9:13	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
100		Arash Haghshenas <arash@boots-coots.com>	Egbert, Thomas <TEgbert@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/4/2016 9:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
101		Unspecified Sender	Arash Haghshenas <arash@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/4/2016 10:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

102		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
103						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

104		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
105						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

106		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
107						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

108		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
109						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

110		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
111						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

112		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
113						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

114		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
115						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

116		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
117						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

118		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
119						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

120		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven Mulholland <Steven.Mulholland@halliburton.com>; Ryan Zallas <Ryan.Zallas@Halliburton.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
121						2/4/2016 10:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
122		Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>			2/5/2016 8:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
123						2/5/2016 8:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
124						2/5/2016 8:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

125						2/5/2016 8:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
126						2/5/2016 8:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
127		Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>			2/5/2016 9:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
128		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>			2/5/2016 9:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
129		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>			2/5/2016 10:03	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
130						2/5/2016 10:03	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
131		Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>		2/5/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
132						2/5/2016 11:49	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
133		Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>		2/5/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

134						2/5/2016 11:49	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
135		Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; John Wright <john.wright@bearco-intl.com>; Morten Haug Emilsen <morten.haug.emilsen@addenergy.no>; Pete Slagel <pete@slagel.net>; John Hatteberg <jhatteberg@boots-coots.com>	Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd (TVandePutte@sempr autilities.com)		2/6/2016 9:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
136						2/6/2016 9:27	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
137		Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>		2/6/2016 10:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
138		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			2/6/2016 16:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
139		Lane, Bret <tpjbl@enova.com>	Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>		2/7/2016 8:24	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

140		Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>			2/7/2016 8:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
141		Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>			2/7/2016 8:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
142		Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
143						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
144						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
145						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
146						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
147		Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
148						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

149						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
150						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
151						2/7/2016 11:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
152		Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
153		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
154		Lane, Bret <tpjbl@enova.com>	Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
155		Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/7/2016 13:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
156						2/7/2016 13:02	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
157		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd (TVandePutte@semprautilities.com)	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger (RSchwecke@semprautilities.com)		2/7/2016 13:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

158						2/7/2016 13:02	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
159	AC_CPUC_0165819	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>	Tomkins, Sharon <STomkins@semprautilities.com>		2/8/2016 5:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
160	AC_CPUC_0165828	Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I (JCho@semprautilities.com); Schwecke, Rodger (RSchwecke@semprautilities.com); Don Shackelford <donwshackelford@yahoo.com>	Tomkins, Sharon <STomkins@semprautilities.com>		2/8/2016 5:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
161		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Egbert, Thomas <TEgbert@semprautilities.com>	'Arash Haghshenas' <arash@boots-coots.com>		2/8/2016 9:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
162	AC_CPUC_0165837	Lane, Bret <JLane@semprautilities.com>	Don Schackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			2/8/2016 18:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
163	AC_CPUC_0165839	Lane, Bret <tpjbl@enova.com>	Don Schackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			2/8/2016 18:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
164	AC_CPUC_0165844	Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@semprautilities.com>; Don Schackelford <donwshackelford@yahoo.com>			2/8/2016 18:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
165	AC_CPUC_0165841	Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Don Schackelford <donwshackelford@yahoo.com>			2/8/2016 18:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

166	AC_CPUC_0170162	Lane, Bret <tpjbl@enova.com>	Don Shackelford <donwshackelford@yahoo.com>; John Wright <john.wright@bearco-intl.com>; Pete Slagel <pete@slagel.net>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Morten Haug Emilsen <morten.haug.emilsen@addenergy.no>; Arash Haghshenas <arash@boots-coots.com>; John Hatteberg <jhatteberg@boots-coots.com>	Schwecke, Rodger (RSchwecke@sempra utilities.com)		2/9/2016 5:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
167	AC_CPUC_0165847	Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/9/2016 8:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
168		Lane, Bret <JLane@semprautilities.com>	John Wright <john.wright@bearco-intl.com>; Pete Slagel <pete@slagel.net>; Morten Haug Emilsen <morten.haug.emilsen@addenergy.no>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Arash Haghshenas <arash@boots-coots.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville <Wayne.Courville@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@sempr autilities.com>		2/9/2016 15:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

169						2/9/2016 15:07	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
170	AC_CPUC_0165850	Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 11:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
171	AC_CPUC_0165851	Lane, Bret <JLane@semprautilities.com>	Chris Yeung <Chris.Yeung@Halliburton.com>; Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
172	AC_CPUC_0165860	Lane, Bret <JLane@semprautilities.com>	Chris Yeung <Chris.Yeung@Halliburton.com>; Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
173	AC_CPUC_0165869	Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@semprautilities.com>; Chris Yeung <Chris.Yeung@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
174	AC_CPUC_0165872	Chris Yeung <Chris.Yeung@Halliburton.com>	Don Shackelford <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
175		Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>			2/11/2016 13:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

176						2/11/2016 13:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
177		Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/12/2016 8:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
178		Van de Putte, Todd <tvandepu@enova.com>	'Don Shackelford' <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/12/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
179		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Don Shackelford' <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/12/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
180		Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Cho, Jimmie I <JCho@semprautilities.com>; Doug Derr <dderr@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Guy Fox <gfox@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		3/10/2016 6:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
181		JLane@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Cho, Jimmie I <JCho@semprautilities.com>; Doug Derr <dderr@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Guy Fox <gfox@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		3/10/2016 6:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

182		Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
183		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
184		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

185		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
186		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

187		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
188		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
189		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

190		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
191		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

192		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
193		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

194		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
195		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

196		Navin, Neil <nnavin@enova.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
197		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>	Michael Noel <Mike.Noel@Halliburton.com>; Sera, Travis <TSera@semprautilities.com>		3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

198		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
199		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

200		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
201		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

202		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
203		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
204		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

205		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
206		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Guy Fox <gfox@boots-coots.com>			3/14/2016 18:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
207		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 4:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
208		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 4:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
209		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 4:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
210		Navin, Neil <nnavin@enova.com>	Guy Fox <gfox@boots-coots.com>			3/15/2016 7:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

211		Mail Delivery Subsystem <MAILER-DAEMON@ms-smtp-p01.sempra.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 7:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
212		Navin, Neil <NNavin@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 7:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
213		Navin, Neil <nnavin@enova.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 7:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
214		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 8:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
215		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 8:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

216		Navin, Neil <nnavin@enova.com>	William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/15/2016 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
217		Mail Delivery Subsystem <MAILER-DAEMON@ms-smtp-p01.sempra.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
218		Navin, Neil <NNavin@semprautilities.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
219		Navin, Neil <nnavin@enova.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
220		Unspecified Sender	Jim.LaGrone@boots-coots.com	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		3/16/2016 9:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
221						3/16/2016 9:34	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
222						3/16/2016 9:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
223		Navin, Neil <nnavin@enova.com>	Jim.LaGrone@boots-coots.com	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		3/16/2016 9:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
224						3/16/2016 9:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
225						3/16/2016 9:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

226		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Tracy, Jill <JTracy@semprautiliti es.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>		3/16/2016 13:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
227		Carl Cramm <Carl.Cramm@boots-coots.com>	NNavin@semprautilities.com	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halli burton.com>; Leonardo Portillo <lportillo@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>		3/18/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
228						3/18/2016 13:32	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
229						3/18/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
230		Navin, Neil <nnavin@enova.com>	Carl Cramm <Carl.Cramm@boots-coots.com>			3/18/2016 13:52	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
231		Leonardo Portillo <lportillo@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com >			3/21/2016 5:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
232		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com >			3/21/2016 7:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

233		Unspecified Sender	Carl Cramm <Carl.Cramm@boots-coots.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 9:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
234		Navin, Neil <nnavin@enova.com>	Carl Cramm <Carl.Cramm@boots-coots.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 10:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
235		Navin, Neil <nnavin@enova.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 10:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

236		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 10:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
237		Leonardo Portillo <lportillo@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/21/2016 12:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
238		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Guy Fox <gfox@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
239		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/21/2016 14:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
240		Doug Derr <dderr@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/22/2016 3:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

241		Doug Derr <dderr@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/22/2016 10:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
242		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
243						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
244						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
245						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
246						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

247		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Rodger Schwecke <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
248						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
249						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
250						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
251						3/23/2016 13:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
252		Doug Derr <dderr@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			3/23/2016 14:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

253		Navin, Neil <nnavin@enova.com>	Navin,Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke,Rodger <RSchwecke@semprautilities.com>; Tracy,Jill <JTracy@semprautilities.com>; La Fevers,Glenn <GLaFevers@semprautilities.com>; Hamze,Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 14:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
254		Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/23/2016 21:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
255		Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

256		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
257		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
258		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

259		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
260		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
261		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
262		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/24/2016 4:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

263		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/24/2016 4:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
264		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/24/2016 6:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
265		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; deby@blowoutengineers.com; David Vaught <David.Vaught@halliburton.com>; Mark Brake <Mark.Brake@Halliburton.com>; jlarrison@blowoutengineers.com; Jim LaGrone <Jim.LaGrone@boots-coots.com>		3/24/2016 9:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

266		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; deby@blowoutengineers.com; David Vaught <David.Vaught@halliburton.com>; Mark Brake <Mark.Brake@Halliburton.com>; jlarrison@blowoutengineers.com; Jim LaGrone <Jim.LaGrone@boots-coots.com>		3/24/2016 9:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
267		Tracy, Jill <jtracy@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
268		JTracy@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
269		Tracy, Jill <JTracy@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

270		Tracy, Jill <JTracy@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
271		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
272						3/24/2016 10:59	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
273		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
274						3/24/2016 10:59	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
275						3/24/2016 10:59	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

276		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>		3/28/2016 8:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
277						3/28/2016 8:13	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
278		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/28/2016 8:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

279		Navin, Neil <NNavin@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>		3/28/2016 8:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
280		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>		3/28/2016 8:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

281		Navin, Neil <NNavin@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>		3/28/2016 8:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
282		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	William Sheridan - B&C <wsheridan@boots-coots.com>; Rosilyn Saulsberry <rsaulsberry@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>		3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
283						3/31/2016 4:55	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
284						3/31/2016 4:55	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
285		Guy Fox <gfox@boots-coots.com>	Navin, Neil (NNavin@semprautilities.com); tvandeputte@semprautilities.com	William Sheridan - B&C <wsheridan@boots-coots.com>; Rosilyn Saulsberry <rsaulsberry@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>		3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

286						3/31/2016 4:55	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
287						3/31/2016 4:55	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
288		Rubin, Jonathan <JRubin@semprautilities.com>	'jim.lagrone@boots-coots.com'; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/4/2016 11:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
289		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			4/4/2016 11:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
290		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
291		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
292		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
293		Rubin, Jonathan <JRubin@semprautilities.com>	'jim.lagrone@boots-coots.com'; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/5/2016 11:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
294		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 12:51	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

295						4/5/2016 12:51	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
296						4/5/2016 12:51	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
297		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. (CBrandy@semprautilities.com)	Navin, Neil <NNavin@semprautilities.com>		4/5/2016 13:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
298						4/5/2016 13:06	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
299						4/5/2016 13:06	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
300		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>		4/5/2016 13:10	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
301						4/5/2016 13:10	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
302						4/5/2016 13:10	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
303		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>		4/5/2016 13:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
304		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rubin, Jonathan <JRubin@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/5/2016 13:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

305		Van de Putte, Todd <TVandePutte@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
306		Van de Putte, Todd <tvandepu@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
307		Unspecified Sender	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
308		Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>		4/5/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
309		Rubin, Jonathan <JRubin@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>			4/5/2016 15:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
310		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
311		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:15	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
312		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
313		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

314		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>		4/5/2016 17:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
315		Navin, Neil <NNavin@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>		4/6/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
316		Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 10:24	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
317		Chechitelli, Frank <FChechitelli@semprautilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Andy Reif <Andy.Reif@halliburton.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony		4/6/2016 13:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

318						4/6/2016 13:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
319						4/6/2016 13:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
320		Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:10	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
321		Tracy, Jill <jtracy@enova.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

322		Unspecified Sender	Chechitelli, Frank <FChechitelli@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
323		Tracy, Jill <JTracy@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:20	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

324		Chechitelli, Frank <FChechitelli@semprautilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 9:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
325		Chechitelli, Frank <FChechitelli@semprautilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 10:10	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
326						4/7/2016 10:10	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

327						4/7/2016 10:10	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
328		John Walters - B&C <jwalters@boots-coots.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 10:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
329		Unspecified Sender	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/8/2016 13:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

330		Navin, Neil <NNavin@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/8/2016 13:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
331		Navin, Neil <NNavin@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/8/2016 13:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
332		Unspecified Sender	Gates, Beth A. <BAGates@semprautilities.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/11/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
333		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/11/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

334		Unspecified Sender	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn (GLaFevers@semprautilities.com); Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
335						4/11/2016 7:29	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
336						4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
337						4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
338						4/11/2016 7:29	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
339		Van de Putte, Todd <TVandePutte@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
340						4/11/2016 7:31	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
341						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
342						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
343						4/11/2016 7:31	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

344		Van de Putte, Todd <tvandepu@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
345						4/11/2016 7:31	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
346						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
347						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
348						4/11/2016 7:31	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
349		Van de Putte, Todd <TVandePutte@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
350						4/11/2016 7:31	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
351						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
352						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
353						4/11/2016 7:31	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

354		Petrizzo, Hilary E <HPetrizzo@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>		4/11/2016 7:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
355		Petrizzo, Hilary E <7957911c867c4a23bf6 5558f32762b9f-petrizzo, hilary e@enova.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>		4/11/2016 7:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
356		Gates, Beth A. <BAGates@sempra utilities.com>	Petrizzo, Hilary E <HPetrizzo@sempra utilities.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/11/2016 7:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
357		Unspecified Sender	Van de Putte, Todd <TVandePutte@sempra utilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>		4/11/2016 8:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
358		Schwecke, Rodger <RSchwecke@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Petrizzo, Hilary E <HPetrizzo@sempra utilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>		4/11/2016 9:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
359		Schwecke, Rodger <rschwecke@enova.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Petrizzo, Hilary E <HPetrizzo@sempra utilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>		4/11/2016 9:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
360		Schwecke, Rodger <RSchwecke@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Petrizzo, Hilary E <HPetrizzo@sempra utilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>		4/11/2016 9:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

361		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
362		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
363		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
364		Rubin, Jonathan <JRubin@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Phipps, Krista L <KPhipps@semprautilities.com>		4/11/2016 13:03	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
365		Van de Putte, Todd <tvandepu@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
366						4/11/2016 14:07	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
367						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
368						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
369						4/11/2016 14:07	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

370		Unspecified Sender	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
371						4/11/2016 14:07	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
372						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
373						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
374		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
375		Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

376		Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
377		Tracy, Jill <jtracy@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
378		Unspecified Sender	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
379		Unspecified Sender	'Arash Haghshenas' <arash@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

380						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
381						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
382						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
383						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
384						4/14/2016 12:54	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
385						4/14/2016 12:54	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

386						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
387						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
388						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
389						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
390						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
391						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

392						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
393						4/14/2016 12:54	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
394		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Arash Haghshenas' <arash@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
395						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
396						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
397						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

398						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
399						4/14/2016 12:54	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
400						4/14/2016 12:54	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
401						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
402						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
403						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

404						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
405						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
406						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
407						4/14/2016 12:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
408						4/14/2016 12:54	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
409		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Arash Haghshenas <arash@boots-coots.com>		4/14/2016 12:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

410		Arash Haghshenas <arash@boots-coots.com>	Hassan, Kim <KHassan@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:14	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
411		Hassan, Kim <KHassan@semprautilities.com>	Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		4/14/2016 13:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
412		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>; Arash Haghshenas <arash@boots-coots.com>			4/14/2016 13:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
413		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>; Arash Haghshenas <arash@boots-coots.com>			4/14/2016 13:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
414		Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
415		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

416		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
417		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
418		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
419		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
420		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 14:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
421		Navin, Neil <NNavin@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/14/2016 18:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
422		Navin, Neil <nnavin@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/14/2016 18:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

423						4/14/2016 18:06	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
424		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com> - on behalf of - Shapiro, Daniel <dshapiro@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/15/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
425		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com> - on behalf of - Shapiro, Daniel <dshapiro@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/15/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
426		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

427		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

428		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

429		Shapiro, Daniel <DShapiro@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager <jtager@henkels.com>; Kysar, Scott	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

430		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

431		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

432		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M) <jbernard@henkels.com>; Leyna Nguyen <lnguyen@henkels.com>; Dennis <leedco@aol.com>; Jeremy Tager	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
433		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
434						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
435						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
436						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
437						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

438		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
439						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
440						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
441						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
442						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
443		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
444						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
445						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
446						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
447						4/18/2016 6:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
448		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilitie s.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 7:09	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

449		Van de Putte, Todd <TVandePutte@sempra utilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 7:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
450		Van de Putte, Todd <tvandepu@enova.com >	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 7:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
451		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 7:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
452		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilitie s.com>	Richard Hatteberg <rhatteberg@boots-coots.com>		4/18/2016 7:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
453		Van de Putte, Todd <TVandePutte@sempra utilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
454						4/18/2016 8:02	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
455		Van de Putte, Todd <tvandepu@enova.com >	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
456						4/18/2016 8:02	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
457		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>		4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
458						4/18/2016 8:02	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

459		Van de Putte, Todd <tvandepu@enova.com>	'rhatteberg@boots-coots.com'			4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
460						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
461						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
462						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
463						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
464		Unspecified Sender	rhatteberg@boots-coots.com			4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
465						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
466						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
467						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
468						4/18/2016 8:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
469		Van de Putte, Todd <tvandepu@enova.com>	'rhatteberg@boots-coots.com'			4/18/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
470						4/18/2016 8:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
471		Unspecified Sender	rhatteberg@boots-coots.com			4/18/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

472						4/18/2016 8:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
473		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 11:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
474		Van de Putte, Todd <tvandepu@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/18/2016 13:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
475		Unspecified Sender	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/18/2016 13:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
476		Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>		4/19/2016 9:09	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
477		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Joseph Kennedy <Joseph.Kennedy@halliburton.com>		4/20/2016 6:08	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
478		Navin, Neil <NNavin@semprautilities.com>	Guy Fox <gfox@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Razavi, Avideh <ARazavi2@semprautilities.com>		4/20/2016 7:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
479		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Razavi, Avideh <ARazavi2@semprautilities.com>		4/20/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
480	AC_CPUC_0183950	Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/21/2016 12:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

481	AC_CPUC_0183952	Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/21/2016 12:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
482	AC_CPUC_0183948	Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; rhatteberg@boots-coots.com	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/21/2016 12:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
483		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; rhatteberg@boots-coots.com; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/25/2016 8:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
484						4/25/2016 8:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
485		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/25/2016 8:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
486						4/25/2016 8:48	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
487		Tracy, Jill <jtracy@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

488		Tracy, Jill <jtracy@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; jim.lagrone@boots-coots.com; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
489		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>; Levine, Randall Mark <randall.levine@morganlewis.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

490		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; jim.lagrone@boots-coots.com; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
491		Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; jim.lagrone@boots-coots.com; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

492		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>; Levine, Randall Mark <randall.levine@morganlewis.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
493		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

494		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
495		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

496		Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
497		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

498		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
499		Tracy, Jill <jtracy@enova.com>	'Levine, Randall Mark' <randall.levine@morganlewis.com>			4/25/2016 12:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
500		Tracy, Jill <jtracy@enova.com>	Levine, Randall Mark <randall.levine@morganlewis.com>			4/25/2016 12:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
501		Schwecke, Rodger <rschwecke@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 7:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
502		Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 7:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

503		Van de Putte, Todd <tvandepu@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
504		Schwecke, Rodger <rschwecke@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 8:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
505		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Dozier, Mike <MDozier@semprautilities.com>	DL_B&C Engineering <engineering@boots-coots.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>; DL_Wellsure <DL_Wellsure@halliburton.com>		4/26/2016 8:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
506						4/26/2016 8:19	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
507		Tracy, Jill <jtracy@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>		4/26/2016 8:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

508		Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>		4/26/2016 8:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
509		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/26/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
510		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/26/2016 19:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Work Product
511						4/26/2016 19:04	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Work Product

512		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/26/2016 19:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
513						4/26/2016 19:04	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
514		Navin, Neil <nnavin@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>	James LaGrone (jim.lagrone@boots-coots.com)		4/27/2016 12:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
515						4/27/2016 12:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
516		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
517						5/3/2016 14:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
518		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
519						5/3/2016 14:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

520		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Tracy, Jill <JTracy@semprautiliti es.com>; Navin, Neil <NNavin@semprautilit ies.com>; Hamze, Firas <FHamze@semprautil ities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
521		Van de Putte, Todd <TVandePutte@sempra utilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Tracy, Jill <JTracy@semprautiliti es.com>; Navin, Neil <NNavin@semprautilit ies.com>; Hamze, Firas <FHamze@semprautil ities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
522						5/3/2016 14:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
523		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com); Schwecke, Rodger <RSchwecke@sempr autilities.com>; Tracy, Jill <JTracy@semprautiliti es.com>; Navin, Neil <NNavin@semprautilit ies.com>; Hamze, Firas <FHamze@semprautil ities.com>		5/4/2016 16:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

524		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com); Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/4/2016 16:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
525		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			5/5/2016 5:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
526		Van de Putte, Todd <tvandepu@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>			5/5/2016 6:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
527		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>; 'Blake, Thomas FCL' <TBlake@fugro.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; DL_B&C Engineering <engineering@boots-coots.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>; Bo Burris <bburris@boots-coots.com>		5/6/2016 10:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

528						5/6/2016 10:18	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
529		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Richard Hatteberg <rhatteberg@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		5/16/2016 8:37	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
530		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Richard Hatteberg <rhatteberg@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		5/16/2016 8:37	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
531		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn (GLaFevers@sempra utilities.com); Schwecke, Rodger <RSchwecke@sempr autilities.com>; Tracy, Jill <JTracy@semprautiliti es.com>; Navin, Neil <NNavin@semprautilit ies.com>		5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
532						5/24/2016 8:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
533						5/24/2016 8:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
534						5/24/2016 8:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
535						5/24/2016 8:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
536						5/24/2016 8:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
537		Petrizzo, Hilary E <HPetrizzo@semprautili ties.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Healy, Gregory <GHealy@semprautilit ies.com>		6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

538						6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
539		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Healy, Gregory <GHealy@semprautilities.com>		6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
540						6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
541		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>		6/13/2016 7:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
542						6/13/2016 7:05	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
543		Unspecified Sender	Wayne Courville <Wayne.Courville@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>		6/13/2016 7:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
544						6/13/2016 7:05	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
545		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/13/2016 7:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
546						6/13/2016 7:27	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
547		Hamze, Firas <tpfhh@enova.com>	'Fernandez, Darrell' <Darrell.Fernandez@consultant.aecom.com>; 'rgomez@boots-coots.com'			7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
548						7/6/2016 21:26	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

549		Hamze, Firas <tpfhh@enova.com>	'Fernandez, Darrell' <Darrell.Fernandez@consultant.aecom.com>; 'rgomez@boots-coots.com'			7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
550						7/6/2016 21:26	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
551		Unspecified Sender	'Fernandez, Darrell' <Darrell.Fernandez@consultant.aecom.com>; rgomez@boots-coots.com			7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
552						7/6/2016 21:26	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
553		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; Orellana, Jennifer <JOrellana2@sempra utilities.com>		7/19/2016 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
554						7/19/2016 9:57	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

555		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Van de Putte, Todd <TVandePutte@semp rautilities.com>; Orellana, Jennifer (JOrellana2@sempra utilities.com)		7/19/2016 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
556						7/19/2016 9:57	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
557		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com >; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>; Navin, Neil <NNavin@semprautilit ies.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Van de Putte, Todd <TVandePutte@semp rautilities.com>; Orellana, Jennifer <JOrellana2@sempra utilities.com>		7/19/2016 11:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

558		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		7/19/2016 11:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
559		Jim LaGrone <Jim.LaGrone@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Richard Hatteberg <rhatteberg@boots-coots.com>		7/19/2016 13:14	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
560		GLaFevers@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Richard Hatteberg <rhatteberg@boots-coots.com>		7/19/2016 13:15	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
561		Tracy, Jill <JTracy@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
562						7/22/2016 8:56	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
563		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Work Product

564						7/22/2016 8:56	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Work Product
565		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempr autilities.com>		7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
566						7/22/2016 8:56	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
567		Tracy, Jill <JTracy@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>			7/22/2016 11:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
568						7/22/2016 11:02	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

569		Rolando Gomez <Rolando.Gomez@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; DL_B&C Engineering <engineering@boots-coots.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>		7/25/2016 11:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
570						7/25/2016 11:45	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
571		La Fevers, Glenn <glafever@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/8/2016 17:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
572		GLaFevers@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/8/2016 17:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
573		Jim LaGrone <Jim.LaGrone@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/8/2016 18:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
574		La Fevers, Glenn <glafever@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			8/8/2016 18:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
575						8/10/2016 16:48	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
576		Jim LaGrone <Jim.LaGrone@boots-coots.com>	John Walters - B&C <jwalters@boots-coots.com>; Eric Bivens <Eric.Bivens@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Dominick Bellotte <Dominick.Bellotte@halliburton.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/17/2016 17:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

577		Dominick Bellotte <Dominick.Bellotte@halliburton.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; John Walters - B&C <jwalters@boots-coots.com>; Eric Bivens <Eric.Bivens@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/17/2016 20:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
578		Haley McIntosh <hmmcintosh@jonesday.com>	jim.lagrone@boots-coots.com	Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 10:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
579						8/18/2016 10:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
580		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 11:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
581						8/18/2016 11:47	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
582		Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>	Haley McIntosh <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 12:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

583		Frescas, Arturo <AFrescas@semprautilities.com>	'Eliasian, Maghdi' <maghdi.eliasian@morganlewis.com>; Haley McIntosh <hmmcintosh@jonesday.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 12:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
584		Haley McIntosh <hmmcintosh@jonesday.com>	mdozier@semprautilties.com	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		8/18/2016 14:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
585						8/18/2016 14:00	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
586						8/18/2016 14:00	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
587		Rolando Gomez <Rolando.Gomez@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>			8/23/2016 11:08	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
588		Ng, Deana M <dmng@enova.com>	Ng, Deana M <DNg@semprautilities.com>; Dozier, Mike <MDozier@semprautilities.com>; Volkmar, Mike <MVolkmar@semprautilities.com>; jim.lagrone@boots-coots.com; Haley McIntosh (hmmcintosh@jonesday.com)			8/23/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

589		Ng, Deana M <DNg@semprautilities.com>	Dozier, Mike <MDozier@semprautilities.com>; Volkmar, Mike <MVolkmar@semprautilities.com>; jim.lagrone@boots-coots.com; Haley McIntosh (hmmcintosh@jonesday.com)			8/23/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
590		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>	Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/24/2016 12:08	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
591		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			8/29/2016 10:15	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
592		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			8/29/2016 10:15	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
593		Bill Whitney/Blade <BWhitney@blade-energy.com>	Bill Whitney/Blade <BWhitney@blade-energy.com>; Jim.LaGrone@boots-coots.com; Andrews, Larry J <LAndrews@semprautilities.com>; Nigel Alvares/Blade <NAlvares@blade-energy.com>; Randall L Rudolf/Blade <rrudolf@blade-energy.com>; Rolando.Gomez@boots-coots.com; Van de Putte, Todd <TVandePutte@semprautilities.com>; Aliso Canyon IDT ConfRoom 972-712-8400/Corporate <Aliso_Canyon_IDT_ConfRoom_972-712-8400/Corporate@mail.blade-energy.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Ravi Krishnamurthy/Blade <ravimk@blade-energy.com>		8/29/2016 11:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

594		Tracy, Jill <JTracy@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
595						9/1/2016 13:54	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Work Product
596		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
597						9/1/2016 13:54	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
598		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
599						9/1/2016 13:54	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

600		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
601						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
602						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
603						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
604						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

605						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
606		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
607						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
608						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
609						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
610						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

611						9/1/2016 15:38	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
612		La Fevers, Glenn <GLaFevers@sempraut ilities.com>	Van de Putte, Todd <TVandePutte@semprautilitie s.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautiliti es.com>		9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
613						9/1/2016 15:39	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
614						9/1/2016 15:39	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
615						9/1/2016 15:39	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

616						9/1/2016 15:39	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
617						9/1/2016 15:39	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
618		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
619						9/1/2016 15:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
620						9/1/2016 15:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

621						9/1/2016 15:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
622		La Fevers, Glenn <GLaFevers@sempraut ilities.com>	Van de Putte, Todd <TVandePutte@semprautilitie s.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautiliti es.com>		9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
623						9/1/2016 15:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
624						9/1/2016 15:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
625						9/1/2016 15:40	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

626		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
627						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
628						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
629						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
630		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

631						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
632						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
633						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
634		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
635						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

636						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
637						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
638		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
639						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
640						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

641						9/1/2016 15:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
642		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
643						9/1/2016 15:42	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
644						9/1/2016 15:42	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
645		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

646						9/1/2016 15:42	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
647						9/1/2016 15:42	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
648		Orellana, Jennifer <jorella2@enova.com>	Orellana,Jennifer <JOrellana2@semprautilities.com>; Schwecke,Rodger <RSchwecke@semprautilities.com>; Tracy,Jill <JTracy@semprautilities.com>; Navin,Neil <NNavin@semprautilities.com>; La Fevers,Glenn <GLaFevers@semprautilities.com>; Van de Putte,Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/2/2016 3:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
649		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		9/2/2016 9:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

650		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)		9/2/2016 9:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
651		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:09	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
652		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
653		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
654		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
655		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
656		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

657		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
658		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
659		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
660		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

661		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
662		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/2/2016 11:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
663		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/2/2016 11:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

664		Tracy, Jill <JTracy@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
665						9/6/2016 10:35	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Work Product
666		Tracy, Jill <jtracy@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
667						9/6/2016 10:35	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
668		Unspecified Sender	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

669						9/6/2016 10:35	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
670		Navin, Neil <NNavin@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
671		Van de Putte, Todd <tvandepu@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
672		Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
673		Van de Putte, Todd <TVandePutte@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

674		La Fevers, Glenn <GLaFevers@sempraut ilities.com>	Van de Putte, Todd <TVandePutte@semprautilitie s.com>; Tracy, Jill <JTracy@semprautilities.com >; Navin, Neil <NNavin@semprautilities.com >; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
675		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilitie s.com>; Tracy, Jill <JTracy@semprautilities.com >; Navin, Neil <NNavin@semprautilities.com >; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
676		Unspecified Sender	Van de Putte, Todd <TVandePutte@semprautilitie s.com>; Tracy, Jill <JTracy@semprautilities.com >; Navin, Neil <NNavin@semprautilities.com >; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
677		La Fevers, Glenn <GLaFevers@sempraut ilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando.Gomez@boots-coots.com			9/11/2016 16:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
678		Rolando Gomez <Rolando.Gomez@boot s-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities. com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/11/2016 18:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
679		GLaFevers@semprautili ties.com	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/11/2016 19:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
680		La Fevers, Glenn <glafever@enova.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/11/2016 19:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
681		Jim LaGrone <Jim.LaGrone@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities. com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			9/12/2016 5:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
682		GLaFevers@semprautili ties.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@bo ots-coots.com>		9/12/2016 6:10	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

683		La Fevers, Glenn <glafever@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		9/12/2016 6:10	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
684		La Fevers, Glenn <GLaFevers@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>		9/12/2016 6:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
685						9/12/2016 6:57	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
686	AC_CPUC_0186107	Unspecified Sender	Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 7:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
687	AC_CPUC_0186437	La Fevers, Glenn <glafever@enova.com>	Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 7:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

688	AC_CPUC_0186327	La Fevers, Glenn <GLaFevers@semprautilities.com>	Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 7:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
689	AC_CPUC_0186547	Unspecified Sender	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
690						9/12/2016 10:59	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
691	AC_CPUC_0186659	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
692						9/12/2016 10:59	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
693	AC_CPUC_0186661	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

694						9/12/2016 10:59	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
695		La Fevers, Glenn <GLaFevers@semprautilities.com>	Hamze, Firas <FHamze@semprautilities.com>			9/12/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
696		La Fevers, Glenn <GLaFevers@semprautilities.com>	Hamze, Firas <FHamze@semprautilities.com>			9/12/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
697						9/12/2016 14:16	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
698		Hamze, Firas <tpfhh@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			9/12/2016 14:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
699		La Fevers, Glenn <glafever@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/20/2016 10:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
700		Rolando Gomez <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/20/2016 11:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
701		La Fevers, Glenn <glafever@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/20/2016 12:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

702		La Fevers, Glenn <glafever@enova.com>	Rolly Gomez (rgomez@boots-coots.com); Jim LaGrone <Jim.LaGrone@boots-coots.com>; timmy.ludeman@weatherford.com			9/23/2016 7:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
703						9/23/2016 7:18	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
704						9/23/2016 7:18	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
705		La Fevers, Glenn <glafever@enova.com>	'Rolly Gomez (rgomez@boots-coots.com)'; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'timmy.ludeman@weatherford.com'			9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
706						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
707						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
708						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
709						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
710						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
711						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
712						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

713						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
714						9/23/2016 7:21	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
715						9/23/2016 7:21	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
716		La Fevers, Glenn <glafever@enova.com>	'Rolly Gomez (rgomez@boots-coots.com)'; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'timmy.ludeman@weatherford.com'			9/23/2016 7:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
717						9/23/2016 7:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
718						9/23/2016 7:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
719						9/23/2016 7:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
720	AC_CPUC_0187359	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/26/2016 15:14	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

721	AC_CPUC_0187371	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
722						9/27/2016 16:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
723	AC_CPUC_0187375	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy,Jill; Navin,Neil; Dentici,Roberto; Van de Putte,Todd; McMahon,Thomas D.; Jim.LaGrone@boots-coots.com; Rolly Gomez; Hamze,Firas; Andrews,Larry J	Schwecke,Rodger; La Fevers,Glenn		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
724						9/27/2016 16:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

725	AC_CPUC_0187365	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
726						9/27/2016 16:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
727	AC_CPUC_0187373	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
728						9/27/2016 16:04	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

729	AC_CPUC_0187381	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 18:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
730	AC_CPUC_0187448	Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/28/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
731		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Dentici, Roberto <RDentici@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		9/28/2016 18:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

732	AC_CPUC_0187459	Dentici, Roberto <719373e031c64d8596e05b6c846ac744-dentici, roberto@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/29/2016 15:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
733	AC_CPUC_0187462	Dentici, Roberto <RDentici@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/29/2016 15:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

734	AC_CPUC_0187477	Tracy, Jill <JTracy@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
735	AC_CPUC_0187473	Unspecified Sender	Dentici, Roberto <RDentici@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

736	AC_CPUC_0187485	Tracy, Jill <JTracy@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
737	AC_CPUC_0187500	Schwecke, Rodger <RSchwecke@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

738	AC_CPUC_0187503	JTracy@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
739	AC_CPUC_0187512	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

740	AC_CPUC_0187516	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
741	AC_CPUC_0187519	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

742	AC_CPUC_0187522	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
743	AC_CPUC_0187546	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
744						9/30/2016 15:23	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

745	AC_CPUC_0187550	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
746						9/30/2016 15:23	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
747	AC_CPUC_0187543	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
748						9/30/2016 15:23	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

749	AC_CPUC_0187553	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
750						9/30/2016 15:23	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
751	AC_CPUC_0187604	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 19:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

752	AC_CPUC_0187614	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 19:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
753		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
754						10/6/2016 9:25	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
755		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	mdonovan@capstonefire.com	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; pwilliams@capstonefire.com		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

756		Rodriguez, Sonia <srodrig3@enova.com>	Lawler, Alexandra G <AGLawler@sempra.com>	Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Tanenbaum, Jeffrey <jtanenbaum@nixonpeabody.com>; Wagher, Ed <EWagher@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Buczkowski, David L <DBuczkowski@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
757		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
758						10/6/2016 9:25	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

759		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
760		Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Robert Salgado <rsalgado@dir.ca.gov>	Kerns, Barry <BKerns@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
761						10/6/2016 9:25	Powerpoint sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
762		Rodriguez, Sonia <srodrig3@enova.com>	Kerns, Barry <BKerns@semprautilities.com>; Wagher, Ed <EWagher@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

763						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
764						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
765		Schwecke, Rodger <RSchwecke@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Ibay, Isaac <IIbay@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
766		Salazar, Jeff <JLSalazar@semprautilities.com>	Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Efron, Mary Ann@DIR <MEfron@dir.ca.gov>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
767						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

768						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
769						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
770						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
771						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
772						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

773						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
774						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
775						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
776						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
777		Cho, Jimmie I <JCho@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

778		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	jim.lagrone@boots-coots.com; mbagget@boots-coots.com; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
779		Kerns, Barry <BKerns@semprautilities.com>	Mike Baggett <mbaggett@boots-coots.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Salgado, Robert@DIR <RSalgado@dir.ca.gov>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
780		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
781		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

782						10/6/2016 9:25	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
783		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
784						10/6/2016 9:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
785		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	mdonovan@capstonefire.com	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; pwilliams@capstonefire.com		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

786		Rodriguez, Sonia <srodrig3@enova.com>	Lawler, Alexandra G <AGLawler@sempra.com>	Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Tanenbaum, Jeffrey <jtanenbaum@nixonpeabody.com>; Wagher, Ed <EWagher@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Buczkowski, David L <DBuczkowski@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
787		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
788						10/6/2016 9:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

789		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
790		Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Robert Salgado <rsalgado@dir.ca.gov>	Kerns, Barry <BKerns@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
791						10/6/2016 9:28	Powerpoint sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
792		Rodriguez, Sonia <srodrig3@enova.com>	Kerns, Barry <BKerns@semprautilities.com>; Wagher, Ed <EWagher@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

793						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
794						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
795		Schwecke, Rodger <RSchwecke@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Ibay, Isaac <IIbay@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
796		Salazar, Jeff <JLSalazar@semprautilities.com>	Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Efron, Mary Ann@DIR <MEfron@dir.ca.gov>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
797						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

798						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
799						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
800						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
801						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
802						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

803						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
804						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
805						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
806						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
807		Cho, Jimmie I <JCho@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

808		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	jim.lagrone@boots-coots.com; mbagget@boots-coots.com; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
809		Kerns, Barry <BKerns@semprautilities.com>	Mike Baggett <mbaggett@boots-coots.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Salgado, Robert@DIR <RSalgado@dir.ca.gov>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
810		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
811		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

812						10/6/2016 9:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
813	AC_CPUC_0187632	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
814	AC_CPUC_0187618	JTracy@semprautilities.com	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

815	AC_CPUC_0187660	Tracy, Jill <jtracy@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
816	AC_CPUC_0187646	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

817	AC_CPUC_0187687	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 20:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
818	AC_CPUC_0187697	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 20:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

819	AC_CPUC_0187704	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 21:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

820	AC_CPUC_0187712	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 21:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
821	AC_CPUC_0187790	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		10/11/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

822	AC_CPUC_0187797	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		10/11/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
823	AC_CPUC_0187801	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		10/11/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
824		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			12/5/2016 7:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
825	AC_CPUC_0188174	Van de Putte, Todd <tvandepu@enova.com>	jgarner@boots-coots.com			1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

826		Unspecified Sender	jgarner@boots-coots.com			1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
827						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
828						1/30/2017 11:30	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
829						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
830						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
831						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

832						1/30/2017 11:30	Spreadsheet sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
833						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
834						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
835						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
836						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
837						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product

838						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
839						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
840						1/30/2017 11:30	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege; Attorney Work Product
841	AC_CPUC_0188214	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			1/31/2017 15:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
842		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/1/2017 7:27	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
843	AC_CPUC_0188216	Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			2/1/2017 8:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
844		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/13/2017 10:37	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

845						2/13/2017 10:37	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
846		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/13/2017 18:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
847		Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/13/2017 18:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
848		McMahon, Thomas D. <TMcMahon@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	John Garner <Jgarner@boots-coots.com>		2/13/2017 19:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
849		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/15/2017 11:33	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

850		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/15/2017 11:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
851		Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			2/15/2017 11:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
852		Unspecified Sender	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/17/2017 21:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
853		Van de Putte, Todd <tvandepu@enova.com>	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/17/2017 21:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
854						2/17/2017 21:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

855	AC_CPUC_0188320	Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>			2/20/2017 20:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
856		Van de Putte, Todd <tvandepu@enova.com>	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/21/2017 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
857						2/21/2017 15:00	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
858						2/21/2017 15:00	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
859						2/21/2017 15:00	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

860		Unspecified Sender	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/21/2017 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
861		Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/21/2017 17:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
862						2/21/2017 17:07	Powerpoint sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
863		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/21/2017 17:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
864		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/22/2017 10:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

865		Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			2/22/2017 13:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
866		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/22/2017 13:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
867		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/22/2017 14:06	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
868	AC_CPUC_0188467	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/24/2017 11:33	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
869	AC_CPUC_0188469	Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>			2/24/2017 13:03	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

870		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/24/2017 13:03	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
871	AC_CPUC_0188471	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/24/2017 13:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
872		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			3/2/2017 10:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
873						3/2/2017 10:32	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
874						3/2/2017 10:32	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

875		Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			3/2/2017 10:33	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
876						3/2/2017 10:33	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
877						3/2/2017 10:33	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
878		Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>			3/3/2017 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
879						3/3/2017 9:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

880						3/3/2017 9:28	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
881		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			3/3/2017 11:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
882		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 9:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
883		Van de Putte, Todd <tvandepu@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 9:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
884		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 10:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
885		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Rick Gentges <rgentges@rcp.com>; Elaine Froneberger <EFroneberger@rcp.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>		3/13/2017 9:08	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

886						3/13/2017 9:08	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
887		Jim LaGrone <Jim.LaGrone@boots-coots.com>	ndodoo@semprautiliteis.com	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; John Garner <Jgarner@boots-coots.com>		3/15/2017 12:51	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
888						3/15/2017 12:51	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
889	AC_CPUC_0188480	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			3/17/2017 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
890	AC_CPUC_0188483	Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			3/20/2017 8:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
891	AC_CPUC_0188486	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			3/20/2017 13:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
892		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		5/2/2017 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

893		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Jim.LaGrone@boots-coots.com; Rolando.Gomez@boots-coots.com	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>; Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/3/2017 8:24	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
894		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
895		Dodoo, Nii Amoo <dnamoo@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
896		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			5/11/2017 7:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
897		Kitson, Amy <awahl@enova.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
898		Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
899		Navin, Neil <nnavin@enova.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
900		Navin, Neil <NNavin@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
901		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:50	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

902		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/11/2017 14:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
903		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 12:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
904		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
905		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
906		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>		5/22/2017 6:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
907		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			5/26/2017 8:58	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
908		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 8:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
909		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 9:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
910		Cerrillos, Jorge <tpjsc@enova.com>	Miguel Munoz <mmunoz@boots-coots.com>			6/1/2017 18:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
911		JCerrillos@semprautilities.com	Miguel Munoz <mmunoz@boots-coots.com>			6/1/2017 18:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
912		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			6/1/2017 18:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

913		Cerrillos, Jorge <tpjsc@enova.com> - on behalf of - Egan, Jason W <jwegan@enova.com>	mmunoz@boots-coots.com			6/1/2017 18:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
914		JCerrillos@semprautilities.com	mmunoz@boots-coots.com			6/1/2017 18:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
915		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	mmunoz@boots-coots.com	Cerrillos, Jorge <JCerrillos@semprautilities.com>		6/13/2017 8:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
916		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/11/2017 6:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
917						7/11/2017 6:41	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
918		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/12/2017 6:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
919						7/12/2017 6:39	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
920		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/12/2017 6:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
921						7/12/2017 6:46	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
922		Cerrillos, Jorge <tpjsc@enova.com>	Miguel Munoz <mmunoz@boots-coots.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		7/13/2017 14:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
923						7/13/2017 14:56	Document sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

924		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Sharepoint <Sharepoint@semprautilities.com>; SempraHelp <SempraHelp@sempra.com>	Tran, Johnny Q <JQTran@semprautilities.com>; Cerrillos, Jorge <JCerrillos@semprautilities.com>; mmunoz@boots-coots.com		7/18/2017 6:36	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
925	AC_CPUC_0188530	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; John Garner <Jgarner@boots-coots.com>		9/8/2017 22:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
926	AC_CPUC_0188539	McMahon, Thomas D. <TMcMahon@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; 'John Garner' <Jgarner@boots-coots.com>		9/8/2017 22:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
927	AC_CPUC_0188548	McMahon, Thomas D. <tptdm@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; 'John Garner' <Jgarner@boots-coots.com>		9/8/2017 22:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

928	AC_CPUC_0188557	Schwecke, Rodger <RSchwecke@sempratilities.com>	McMahon, Thomas D. <TMcMahon@sempratilities.com>	Dentici, Roberto <RDentici@sempratilities.com>; La Fevers, Glenn <GLaFevers@sempratilities.com>; Clorfeine, Sabina B. <SClorfeine@sempratilities.com>; Healy, Gregory <GHealy@sempratilities.com>; Andrews, Larry J <LAndrews@sempratilities.com>; Smith, Christopher J <CSmith8@sempratilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
929	AC_CPUC_0188558	McMahon, Thomas D. <TMcMahon@sempratilities.com>	Schwecke, Rodger <RSchwecke@sempratilities.com>	Dentici, Roberto <RDentici@sempratilities.com>; La Fevers, Glenn <GLaFevers@sempratilities.com>; Clorfeine, Sabina B. <SClorfeine@sempratilities.com>; Healy, Gregory <GHealy@sempratilities.com>; Andrews, Larry J <LAndrews@sempratilities.com>; Smith, Christopher J <CSmith8@sempratilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

930	AC_CPUC_0188560	McMahon, Thomas D. <tptdm@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege
931	AC_CPUC_0188562	TMcMahon@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.	Attorney Client Privilege

Privilege Log Re SED Data Request 64 [5-15-2020]

Prod Beg CPUC DR 16	Prod Beg CPUC DR 64	Email From	Email To	Email CC	Email BCC	Parent Date	Description
AC_CPUC_SED_DR_16_0024845	I1906016_SCG_SED_DR_64_0000003	Kundly, Christine M <CKundly@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		12/15/2015 21:17	Redaction of confidential email communication among SoCalGas personnel reflecting the legal advice and opinions of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024863	I1906016_SCG_SED_DR_64_0000008	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 16:45	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024868	I1906016_SCG_SED_DR_64_0000013	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:28	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024873	I1906016_SCG_SED_DR_64_0000018	Kitson, Amy <AKitson@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:17	Redactions of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024877	I1906016_SCG_SED_DR_64_0000022	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:11	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024881	I1906016_SCG_SED_DR_64_0000026	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:06	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024885	I1906016_SCG_SED_DR_64_0000030	La Fevers, Glenn <glafever@enova.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 15:04	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024890	I1906016_SCG_SED_DR_64_0000035	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 15:02	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024895	I1906016_SCG_SED_DR_64_0000040	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 15:00	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024900	I1906016_SCG_SED_DR_64_0000045	Chechitelli, Frank <FChechitelli@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:35	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024904	I1906016_SCG_SED_DR_64_0000049	Kundly, Christine M <CKundly@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>		12/15/2015 14:33	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024908	I1906016_SCG_SED_DR_64_0000053	La Fevers, Glenn <glafever@enova.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:22	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.

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AC_CPUC_SED_DR_16_0024912	I1906016_SCG_SED_DR_64_0000057	Kitson, Amy <AKitson@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		12/15/2015 14:03	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024915	I1906016_SCG_SED_DR_64_0000060	Kundly, Christine M <CKundly@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>		12/15/2015 13:41	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0024919	I1906016_SCG_SED_DR_64_0000070	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>			12/16/2015 5:43	Redaction of confidential email communication among SoCalGas personnel reflecting the legal advice and opinions of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
	I1906016_SCG_SED_DR_64_0000100	Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/7/2016 13:02	Redactions of confidential email communications among S. Tomkins (in-house counsel), J. Dragna (outside counsel), R. Wyman (outside counsel), M. Thorp (in-house counsel), and R. Dunaway (in-house counsel) requesting and providing legal advice regarding the contents of a draft submission to DOGGR concerning cement plans at the Aliso Canyon facility. This document also contains the legal advice and analysis of S. Tomkins (in-house counsel) regarding the same topic.
AC_CPUC_SED_DR_16_0024965	I1906016_SCG_SED_DR_64_0000111	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>			12/16/2015 5:56	Redactions of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024970	I1906016_SCG_SED_DR_64_0000116	La Fevers, Glenn <GLaFevers@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 15:04	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024975	I1906016_SCG_SED_DR_64_0000121	La Fevers, Glenn <GLaFevers@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:22	Redaction of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024979	I1906016_SCG_SED_DR_64_0000202	Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I <JCho@semprautilities.com>			12/16/2015 5:56	Redactions of confidential email communication containing the legal advice and analysis of K. Lee (in-house counsel) regarding the retention of contractors.
AC_CPUC_SED_DR_16_0024993	I1906016_SCG_SED_DR_64_0000213	Cho, Jimmie I <jicho@enova.com>	Lane, Bret <JLane@semprautilities.com>			12/16/2015 5:43	Redaction of confidential email communication among SoCalGas personnel reflecting the legal advice and opinions of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
	I1906016_SCG_SED_DR_64_0000241	Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd (TVandePutte@semprautilities.com)	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger (RSchwecke@semprautilities.com)		2/7/2016 13:02	Redactions of confidential email communications among S. Tomkins (in-house counsel), J. Dragna (outside counsel), R. Wyman (outside counsel), M. Thorp (in-house counsel), and R. Dunaway (in-house counsel) requesting and providing legal advice regarding the contents of a draft submission to DOGGR concerning cement plans at the Aliso Canyon facility. This document also contains the legal advice and analysis of S. Tomkins (in-house counsel) regarding the same topic.

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AC_CPUC_SED_DR_16_0022012	I1906016_SCG_SED_DR_64_0000246	Cho, Jimmie I <JCho@semprautilities.com>	Thorp, Michael R. <MThorp@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Tomkins, Sharon <STomkins@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Garcia, Albert J <AGarcia6@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		2/4/2016 10:16	Redactions of confidential email communications involving SoCalGas personnel, M. Thorp (in-house counsel), K. Hassan (in-house counsel), S. Tomkins (in-house counsel), and A. Garcia (in-house counsel) in which SoCalGas personnel request legal advice regarding well kill plans.
	I1906016_SCG_SED_DR_64_0000377	Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:47	Redactions of confidential email communications between K. Hassan (in-house counsel) and SoCalGas personnel to facilitate the attorney-client relationship and provision of legal services in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000380	Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:40	Redactions of confidential email communications between K. Hassan (in-house counsel) and SoCalGas personnel to facilitate the attorney-client relationship and provision of legal services in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000382	Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:38	Redaction of confidential email communication between K. Hassan (in-house counsel) and SoCalGas personnel to facilitate the attorney-client relationship and provision of legal services in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000384	Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:30	Redactions of confidential email communications between K. Hassan (in-house counsel) and SoCalGas personnel to facilitate the attorney-client relationship and provision of legal services in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000387	Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:29	Redactions of confidential email communications between K. Hassan (in-house counsel) and SoCalGas personnel to facilitate the attorney-client relationship and provision of legal services in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000389	Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:15	Redactions of confidential email communications between K. Hassan (in-house counsel) and SoCalGas personnel to facilitate the attorney-client relationship and provision of legal services in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000391	Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:11	Redaction of confidential email communication in which SoCalGas personnel requests advice from K. Hassan (in-house counsel) in connection with a request for daily operation reports at Aliso Canyon.
	I1906016_SCG_SED_DR_64_0000397	La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:39	Redactions of confidential email communications among SoCalGas personnel, D. Ng (in-house counsel), R. Levine (outside counsel), S. Mortazavi (in-house counsel), and H. McIntosh (outside counsel) in which D. Ng (in-house counsel) and H. McIntosh (outside counsel) provide and request information to facilitate the provision of legal advice regarding a response to a Blade data request concerning Aliso Canyon. This document also contains the opinions and advice of D. Ng (in-house counsel) regarding the same topic. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to D. Ng and H. McIntosh concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.

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	I1906016_SCG_SED_DR_64_0000453	La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42	Redaction of confidential email communication in which D. Ng (in-house counsel) provides opinions and impressions to SoCalGas personnel and R. Levine (outside counsel) regarding a draft response to a Blade data request. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to SoCalGas' attorneys concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.
	I1906016_SCG_SED_DR_64_0000465	La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Redaction of confidential email communication among D. Ng (in-house counsel), SoCalGas personnel, and R. Levine (outside counsel) to facilitate the attorney-client relationship and provision of legal services in connection with a draft response to a Blade data request. Boots and Coots personnel are included in portions of this communication so that D. Ng may have the benefit of their technical expertise regarding this subject.
	I1906016_SCG_SED_DR_64_0000480	La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Redaction of confidential email communication in which D. Ng (in-house counsel) provides recommendations and information to SoCalGas personnel and R. Levine (outside counsel) regarding a draft response to a Blade data request. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to SoCalGas' attorneys concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.
	I1906016_SCG_SED_DR_64_0000496	La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40	Redaction of confidential email communication among D. Ng (in-house counsel), SoCalGas personnel, and R. Levine (outside counsel) to facilitate the attorney-client relationship and provision of legal services in connection with a draft response to a Blade data request. Boots and Coots personnel are included in portions of this communication so that D. Ng may have the benefit of their technical expertise regarding this subject.
						9/1/2016 15:40	Adobe PDF document reflecting the impressions of D. Ng (in-house counsel) concerning responses to CPUC information requests related to SS-25.
	I1906016_SCG_SED_DR_64_0000508	La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38	Redactions of confidential email communications among SoCalGas personnel, D. Ng (in-house counsel), R. Levine (outside counsel), S. Mortazavi (in-house counsel), and H. McIntosh (outside counsel) in which D. Ng (in-house counsel) and H. McIntosh (outside counsel) provide and request information to facilitate the provision of legal advice regarding a response to a Blade data request concerning Aliso Canyon. This document also contains the opinions and advice of D. Ng (in-house counsel) regarding the same topic. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to D. Ng and H. McIntosh concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.
	I1906016_SCG_SED_DR_64_0000609	La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42	Redaction of confidential email communication in which D. Ng (in-house counsel) provides opinions and impressions to SoCalGas personnel and R. Levine (outside counsel) regarding a draft response to a Blade data request. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to SoCalGas' attorneys concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.

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	I1906016_SCG_SED_DR_64_0000621	La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Redaction of confidential email communication among D. Ng (in-house counsel), SoCalGas personnel, and R. Levine (outside counsel) to facilitate the attorney-client relationship and provision of legal services in connection with a draft response to a Blade data request. Boots and Coots personnel are included in portions of this communication so that D. Ng may have the benefit of their technical expertise regarding this subject.
	I1906016_SCG_SED_DR_64_0000636	La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Redaction of confidential email communication in which D. Ng (in-house counsel) provides recommendations and information to SoCalGas personnel and R. Levine (outside counsel) regarding a draft response to a Blade data request. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to SoCalGas' attorneys concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.
	I1906016_SCG_SED_DR_64_0000652	La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40	Redaction of confidential email communication among D. Ng (in-house counsel), SoCalGas personnel, and R. Levine (outside counsel) to facilitate the attorney-client relationship and provision of legal services in connection with a draft response to a Blade data request. Boots and Coots personnel are included in portions of this communication so that D. Ng may have the benefit of their technical expertise regarding this subject.
						9/1/2016 15:40	Adobe PDF document reflecting the impressions of D. Ng (in-house counsel) concerning responses to CPUC information requests related to SS-25.
	I1906016_SCG_SED_DR_64_0000664	La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38	Redactions of confidential email communications among SoCalGas personnel, D. Ng (in-house counsel), R. Levine (outside counsel), S. Mortazavi (in-house counsel), and H. McIntosh (outside counsel) in which D. Ng (in-house counsel) and H. McIntosh (outside counsel) provide and request information to facilitate the provision of legal advice regarding a response to a Blade data request concerning Aliso Canyon. This document also contains the opinions and advice of D. Ng (in-house counsel) regarding the same topic. Boots and Coots personnel are included in the communications for the purpose of providing technical expertise to D. Ng and H. McIntosh concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.
		Haley McIntosh <hmmcintosh@jonesday.com>	mdozier@semprautilties.com	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		8/18/2016 14:00	Confidential email communications among H. McIntosh (outside counsel), D. Ng (in-house counsel), S. Mortazavi (in-house counsel), and SoCalGas personnel in which H. McIntosh (outside counsel) provides opinions and impressions and requests information for the facilitation of legal advice regarding a draft response to a Blade data request. Boots and Coots personnel are included in portions of the communications for the purpose of providing technical expertise to SoCalGas' attorneys concerning the data request. Boots and Coots did not have interests adverse to SoCalGas or Sempra.
						8/18/2016 14:00	Draft responses to Blade data request concerning SS-25 containing the revisions of H. McIntosh (outside counsel).
AC_CPUC_SED_DR_16_0013710	I1906016_SCG_SED_DR_64_0000930	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:33	Redaction of confidential email communication between SoCalGas personnel and H. McIntosh (outside counsel) regarding a survey created by Boots and Coots in connection with work at Aliso Canyon, made to facilitate the attorney client relationship.

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AC_CPUC_SED_DR_16_0013712	I1906016_SCG_SED_DR_64_0000931	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:32	Redaction of confidential email communication between SoCalGas personnel and H. McIntosh (outside counsel) regarding a survey created by Boots and Coots in connection with work at Aliso Canyon, made to facilitate the attorney client relationship.
AC_CPUC_SED_DR_16_0013812	I1906016_SCG_SED_DR_64_0000958	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:52	Redactions of confidential email communications between SoCalGas personnel and H. McIntosh (outside counsel) regarding a survey created by Boots and Coots in connection with work at Aliso Canyon, made to facilitate the attorney client relationship.
	I1906016_SCG_SED_DR_64_0000969	Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59	Redactions of confidential email communications between SoCalGas personnel and K. Hassan (in-house counsel) regarding the sharing of documents with experts related to Aliso Canyon Reservoir Model. This document contains the opinion and impressions of K. Hassan (in-house counsel) regarding the same topic.
	I1906016_SCG_SED_DR_64_0000971	Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57	Redaction of confidential email communication between SoCalGas personnel and K. Hassan (in-house counsel) regarding the sharing of documents with experts related to Aliso Canyon Reservoir Model.
	I1906016_SCG_SED_DR_64_0000996	Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 14:05	Redactions of confidential email communications between SoCalGas personnel and K. Hassan (in-house counsel) regarding the sharing of documents with experts related to Aliso Canyon Reservoir Model. This document contains the opinion and impressions of K. Hassan (in-house counsel) regarding the same topic.
	I1906016_SCG_SED_DR_64_0000998	Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:58	Redactions of confidential email communications between SoCalGas personnel and K. Hassan (in-house counsel) regarding the sharing of documents with experts related to Aliso Canyon Reservoir Model. This document contains the opinion and impressions of K. Hassan (in-house counsel) regarding the same topic.
AC_CPUC_SED_DR_16_0015866	I1906016_SCG_SED_DR_64_0001005	Howes, Marlin E. <MHowes@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			11/21/2015 10:02	Redactions of confidential email communications in which SoCalGas personnel request legal advice from M. Howes (in-house counsel) regarding a draft response to request for information in connection with Aliso Canyon gas leak. This document contains the thoughts and opinions of M. Howes (in-house counsel) regarding the same subject.
	I1906016_SCG_SED_DR_64_0001008	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59	Redactions of confidential email communications between SoCalGas personnel and K. Hassan (in-house counsel) regarding the sharing of documents with experts related to Aliso Canyon Reservoir Model. This document contains the opinion and impressions of K. Hassan (in-house counsel) regarding the same topic.
	I1906016_SCG_SED_DR_64_0001010	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57	Redaction of confidential email communication between SoCalGas personnel and K. Hassan (in-house counsel) regarding the sharing of documents with experts related to Aliso Canyon Reservoir Model.
AC_CPUC_SED_DR_16_0016551	I1906016_SCG_SED_DR_64_0001036	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 11:12	Redactions of confidential email communications involving SoCalGas personnel and M. Howes (in-house counsel) made for the purpose of requesting and providing legal advice regarding SS-25 relief well planning. This document also contains the opinions and advice of M. Howes (in-house counsel) regarding the same subject.
AC_CPUC_SED_DR_16_0016556	I1906016_SCG_SED_DR_64_0001039	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 8:43	Redaction of confidential email communication in which SoCalGas personnel request legal advice from M. Howes (in-house counsel) regarding response to request for information in connection with Aliso Canyon gas leak.

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AC_CPUC_SED_DR_16_0025018	I1906016_SCG_SED_DR_64_0001045	Kundly, Christine M <CKundly@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			12/15/2015 14:06	Redaction of confidential email communication reflecting the legal analysis and recommendations of K. Lee (in-house counsel) regarding a draft services agreement for well control operations and engineering at SS-25.
AC_CPUC_SED_DR_16_0025628	I1906016_SCG_SED_DR_64_0001054	Healy, Gregory <GHealy@semprautilities.com>	Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>			8/17/2017 12:06	Redaction of confidential email communication between SoCalGas personnel and S. Mortazavi (in-house counsel) to facilitate the attorney-client relationship and provision of legal services in connection with the recording of responses to DOGGR concerning well kill operations at Aliso Canyon.
		Frescas, Arturo <AFrescas@semprautilities.com>	'Eliasian, Maghdi' <maghdi.eliasian@morganlewis.com>; Haley McIntosh <hmmcintosh@jonesday.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 12:40	Confidential email communications among SoCalGas personnel, H. McIntosh (outside counsel), D. Ng (in-house counsel), S. Mortazavi (in-house counsel), A. Frescas (in-house legal staff), and M. Eliasian (legal staff for outside counsel) in which H. McIntosh (outside counsel) provides information for the facilitation of legal advice, and legal staff provide information in response, regarding Blade data requests concerning well kill operations at Aliso Canyon. Boots and Coots personnel are included in portions of this communication so that H. McIntosh may have the benefit of their technical expertise regarding this subject.
		Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>	Haley McIntosh <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 12:28	Confidential email communications among SoCalGas personnel, H. McIntosh (outside counsel), D. Ng (in-house counsel), S. Mortazavi (in-house counsel), A. Frescas (in-house legal staff), and M. Eliasian (legal staff for outside counsel) in which H. McIntosh (outside counsel) provides information for the facilitation of legal advice, and legal staff provide information in response, regarding Blade data requests concerning well kill operations at Aliso Canyon. Boots and Coots personnel are included in portions of this communication so that H. McIntosh may have the benefit of their technical expertise regarding this subject.
		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>		5/22/2017 6:58	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:58	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:29	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 12:39	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/11/2017 14:36	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:50	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.

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		Kitson, Amy <awahl@enova.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Kitson, Amy <awahl@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:38	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			5/11/2017 7:40	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
	I1906016_SCG_SED_DR_64_0001126	Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36	Redaction of confidential email communication among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Navin, Neil <nnavin@enova.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Navin, Neil <NNavin@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
	I1906016_SCG_SED_DR_64_0001174	Dodoo, Nii Amoo <dnamoo@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36	Redaction of confidential email communication among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Jim.LaGrone@boots-coots.com; Rolando.Gomez@boots-coots.com	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>; Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/3/2017 8:24	Confidential email communication among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 9:01	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 8:59	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.
		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			5/26/2017 8:58	Confidential email communications among T. Lotterman (outside counsel), J. Tran (in-house counsel), SoCalGas personnel and Boots & Coots personnel regarding the retention of Boots & Coots as consultants to perform work at direction of counsel.

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
1	AC_CPUC_SED_DR_16_0002215	Healy, Gregory <tpghh@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>			12/10/2015 11:07
2	AC_CPUC_SED_DR_16_0024845	Kundly, Christine M <CKundly@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		12/15/2015 21:17
3	AC_CPUC_SED_DR_16_0024863	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 16:45
4	AC_CPUC_SED_DR_16_0024868	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:28
5	AC_CPUC_SED_DR_16_0024873	Kitson, Amy <AKitson@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:17
6	AC_CPUC_SED_DR_16_0024877	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:11
7	AC_CPUC_SED_DR_16_0024881	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:06
8	AC_CPUC_SED_DR_16_0024885	La Fevers, Glenn <glafever@enova.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 15:04
9	AC_CPUC_SED_DR_16_0024890	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 15:02

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
10	AC_CPUC_SED_DR_16_0024895	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 15:00
11	AC_CPUC_SED_DR_16_0024900	Chechitelli, Frank <FChechitelli@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:35
12	AC_CPUC_SED_DR_16_0024904	Kundly, Christine M <CKundly@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>		12/15/2015 14:33
13	AC_CPUC_SED_DR_16_0024908	La Fevers, Glenn <glafever@enova.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:22
14	AC_CPUC_SED_DR_16_0024912	Kitson, Amy <AKitson@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		12/15/2015 14:03
15	AC_CPUC_SED_DR_16_0024915	Kundly, Christine M <CKundly@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>		12/15/2015 13:41
22	AC_CPUC_SED_DR_16_0042172	John Hatteberg <jhatteberg@boots-coots.com>	Wayne Courville <Wayne.Courville@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/21/2015 10:11
23	AC_CPUC_SED_DR_16_0042181	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:57
24	AC_CPUC_SED_DR_16_0042183	John Hatteberg <jhatteberg@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:55

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
25	AC_CPUC_SED_DR_16_0042184	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:12
26	AC_CPUC_SED_DR_16_0024919	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>			12/16/2015 5:43
28	AC_CPUC_SED_DR_16_0024937	Chris Yeung <Chris.Yeung@Halliburton.com>	Don Shackelford <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:39
29	AC_CPUC_SED_DR_16_0024941	Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@semprautilities.com>; Chris Yeung <Chris.Yeung@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:36
30	AC_CPUC_SED_DR_16_0024944	Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@semprautilities.com>			2/10/2016 12:31
31	AC_CPUC_SED_DR_16_0024947	Lane, Bret <JLane@semprautilities.com>	Chris Yeung <Chris.Yeung@Halliburton.com>; Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:20
32	AC_CPUC_SED_DR_16_0024950	Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/10/2016 12:19
33	AC_CPUC_SED_DR_16_0024953	Lane, Bret <JLane@semprautilities.com>	Chris Yeung <Chris.Yeung@Halliburton.com>; Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:16
34	AC_CPUC_SED_DR_16_0024280	Chris Yeung <Chris.Yeung@Halliburton.com>	Don Shackelford <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:02

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
35	AC_CPUC_SED_DR_16_0024292	Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Chris Yeung <chris.yeung@halliburton.com>; Bryce Hinsch <bryce.hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 11:49
36	AC_CPUC_SED_DR_16_0024956	Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 11:02
37		Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/7/2016 13:02
38						2/7/2016 13:02
39	AC_CPUC_SED_DR_16_0006175	Wagher, Ed <EWagher@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		12/29/2015 18:20
40	AC_CPUC_SED_DR_16_0006255	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>		12/18/2015 13:38
41	AC_CPUC_SED_DR_16_0006258	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>		12/18/2015 13:32
42	AC_CPUC_SED_DR_16_0024965	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>			12/16/2015 5:56
43	AC_CPUC_SED_DR_16_0024970	La Fevers, Glenn <GLaFevers@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 15:04

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
44	AC_CPUC_SED_DR_16_0024975	La Fevers, Glenn <GLaFevers@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:22
45	AC_CPUC_SED_DR_16_0006322	Healy, Gregory <GHealy@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>			12/10/2015 11:07
46	AC_CPUC_SED_DR_16_0006355	Kitson, Amy <AKitson@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>			12/9/2015 15:36
47						12/9/2015 15:36
48						12/9/2015 15:36
49						12/9/2015 15:36
50						12/9/2015 15:36
51	AC_CPUC_SED_DR_16_0006357	Healy, Gregory <GHealy@semprautilities.com>	Salazar, Jeff <JLSalazar@semprautilities.com>			12/10/2015 11:27
52						12/10/2015 11:27

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
53						12/10/2015 11:27
54						12/10/2015 11:27
56	AC_CPUC_SED_DR_16_0006471	Sim, Michelle M <MSim@semprautilities.com>	Alexander, Lisa <LAlexander@semprautilities.com>	Kristjansson, Sue <SKristjansson@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		1/26/2016 9:55
57						1/26/2016 9:55
58	AC_CPUC_SED_DR_16_0006474	Arriola, Dennis <DArriola@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Alexander, Lisa <LAlexander@semprautilities.com>			1/6/2016 14:46
59						1/6/2016 14:46
60						1/6/2016 14:46
61						1/6/2016 14:46
62						1/6/2016 14:46

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
63						1/6/2016 14:46
64						1/6/2016 14:46
65	AC_CPUC_SED_DR_16_0001049	Healy, Gregory <GHealy@semprautilities.com>	Shapiro, Daniel <DShapiro@semprautilities.com>			1/21/2016 16:03
69	AC_CPUC_SED_DR_16_0024979	Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I <JCho@semprautilities.com>			12/16/2015 5:56
77	AC_CPUC_SED_DR_16_0024984	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>	Tomkins, Sharon <STomkins@semprautilities.com>		2/8/2016 5:36
78	AC_CPUC_SED_DR_16_0008040	Schwecke, Rodger <RSchwecke@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		1/31/2016 19:02
79	AC_CPUC_SED_DR_16_0008042	Cho, Jimmie I <jicho@enova.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/31/2016 18:43
80	AC_CPUC_SED_DR_16_0008079	Lane, Bret <JLane@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Arriola, Dennis <DArriola@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/17/2016 10:50
81	AC_CPUC_SED_DR_16_0024993	Cho, Jimmie I <jicho@enova.com>	Lane, Bret <JLane@semprautilities.com>			12/16/2015 5:43

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
82	AC_CPUC_SED_DR_16_0025022	Crider, Scott B <SCrider@sempra.com>	Lane, Bret <JLane@semprautilities.com>			4/28/2016 6:38
83	AC_CPUC_SED_DR_16_0025026	Schwecke, Rodger <RSchwecke@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Dragna, James J. <jim.dragna@morganlewis.com>	Lane, Bret <JLane@semprautilities.com>		7/1/2016 10:38
84	AC_CPUC_SED_DR_16_0025036	Lane, Bret <tpjbl@enova.com>	Crider, Scott B (SCrider@sempra.com)	Tomkins, Sharon <STomkins@semprautilities.com>; Arriola, Dennis <DArriola@semprautilities.com>		4/27/2016 8:02
85	AC_CPUC_SED_DR_16_0025040	Lane, Bret <tpjbl@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			4/27/2016 6:05
86	AC_CPUC_SED_DR_16_0025043	Schwecke, Rodger <RSchwecke@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 13:48
87	AC_CPUC_SED_DR_16_0024998	Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>			2/10/2016 12:31
88	AC_CPUC_SED_DR_16_0025001	Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd (TVandePutte@semprautilities.com)			2/10/2016 12:19
90	AC_CPUC_SED_DR_16_0025009	Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I (JCho@semprautilities.com); Schwecke, Rodger (RSchwecke@semprautilities.com); Don Shackelford <donwshackelford@yahoo.com>	Tomkins, Sharon <STomkins@semprautilities.com>		2/8/2016 5:36
91		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd (TVandePutte@semprautilities.com)	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger (RSchwecke@semprautilities.com)		2/7/2016 13:02

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
92						2/7/2016 13:02
93		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:11
94	AC_CPUC_SED_DR_16_0022012	Cho, Jimmie I <JCho@semprautilities.com>	Thorp, Michael R. <MThorp@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Tomkins, Sharon <STomkins@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Garcia, Albert J <AGarcia6@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		2/4/2016 10:16
95	AC_CPUC_SED_DR_16_0008276	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/31/2016 18:43
96	AC_CPUC_SED_DR_16_0008613	Lane, Bret <tpjbl@enova.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Arriola, Dennis <DArriola@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/17/2016 10:50
97	AC_CPUC_SED_DR_16_0008690	Lane, Bret <tpjbl@enova.com>	Arriola, Dennis <DArriola@semprautilities.com>; Tomkins, Sharon <STomkins@semprautilities.com>			1/13/2016 8:41
101	AC_CPUC_SED_DR_16_0008865	Wagher, Ed <EWagher@semprautilities.com>	Ibay, Isaac <IIbay@semprautilities.com>			12/29/2015 21:24
102	AC_CPUC_SED_DR_16_0008867	Ibay, Isaac <iibay@enova.com>	Wagher, Ed <EWagher@semprautilities.com>			12/29/2015 20:16
103	AC_CPUC_SED_DR_16_0008897	Cho, Jimmie I <JCho@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		12/18/2015 13:40

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
104	AC_CPUC_SED_DR_16_0008903	Kerns, Barry <bkerns@enova.com>	Lane, Bret <JLane@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		12/19/2015 7:33
105	AC_CPUC_SED_DR_16_0008909	Kerns, Barry <bkerns@enova.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>		12/18/2015 13:32
106	AC_CPUC_SED_DR_16_0009323	Healy, Gregory <GHealy@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			1/14/2016 11:36
107	AC_CPUC_SED_DR_16_0009326	Rodriguez, Sonia <srodrig3@enova.com>	Healy, Gregory <GHealy@semprautilities.com>			1/14/2016 11:27
108	AC_CPUC_SED_DR_16_0009328	Healy, Gregory <GHealy@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			1/14/2016 11:15
109	AC_CPUC_SED_DR_16_0010098	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>		6/10/2016 13:42
110	AC_CPUC_SED_DR_16_0010101	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>; 'Haley McIntosh' <hmmcintosh@jonesday.com>		6/10/2016 13:23
111		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>	Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/24/2016 12:08
112		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 11:47

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
113						8/18/2016 11:47
114		Rubin, Jonathan <JRubin@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Phipps, Krista L <KPhipps@semprautilities.com>		4/11/2016 13:03
115		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:47
116		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:40
117		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:38
118		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:30
119		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:29
120		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:15
121		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:11

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
122		Rubin, Jonathan <JRubin@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>			4/5/2016 15:06
123		Tracy, Jill <JTracy@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35
124						9/6/2016 10:35
125		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:39
126						9/1/2016 15:39
127						9/1/2016 15:39
128						9/1/2016 15:39
129						9/1/2016 15:39
130						9/1/2016 15:39

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
131		Tracy, Jill <JTracy@sempra utilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>		9/1/2016 13:54
132						9/1/2016 13:54
133	AC_CPUC_SED_DR_16_0010811	La Fevers, Glenn <glafever@enova.com>	Tracy, Jill <JTracy@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>; Ng, Deana M <DNg@sempra utilities.com>		5/26/2016 16:23
134	AC_CPUC_SED_DR_16_0010813	Tracy, Jill <JTracy@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>; Ng, Deana M <DNg@sempra utilities.com>		5/26/2016 13:45
135	AC_CPUC_SED_DR_16_0010815	Van de Putte, Todd <TVandePutte@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>; Ng, Deana M <DNg@sempra utilities.com>			5/26/2016 13:40
136	AC_CPUC_SED_DR_16_0010817	Schwecke, Rodger <RSchwecke@sempra utilities.com>	La Fevers, Glenn <GLaFevers@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>; Ng, Deana M <DNg@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>			5/26/2016 13:22
137	AC_CPUC_SED_DR_16_0011443	Unspecified Sender	Tracy, Jill <JTracy@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>; Ng, Deana M <DNg@sempra utilities.com>		5/26/2016 16:23
138		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@sempra utilities.com>		9/1/2016 15:42
139						9/1/2016 15:42

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140						9/1/2016 15:42
141		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41
142						9/1/2016 15:41
143						9/1/2016 15:41
144						9/1/2016 15:41
145		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41
146						9/1/2016 15:41
147						9/1/2016 15:41
148						9/1/2016 15:41

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
149		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40
150						9/1/2016 15:40
151						9/1/2016 15:40
152						9/1/2016 15:40
153		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38
154						9/1/2016 15:38
155						9/1/2016 15:38
156						9/1/2016 15:38
157						9/1/2016 15:38

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
158						9/1/2016 15:38
159	AC_CPUC_SED_DR_16_0025046	Tomkins, Sharon <STomkins@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			6/29/2016 18:59
160	AC_CPUC_SED_DR_16_0011948	La Fevers, Glenn <GLaFevers@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 16:23
161	AC_CPUC_SED_DR_16_0025075	Lane, Bret <JLane@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			4/27/2016 6:05
162	AC_CPUC_SED_DR_16_0025078	Ng, Deana M <DNg@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			4/26/2016 16:33
163	AC_CPUC_SED_DR_16_0025242	Schwecke, Rodger <rschwecke@enova.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Dragna, James J. <jim.dragna@morganlewis.com>	Lane, Bret (JLane@semprautilities.com)		7/1/2016 10:38
164	AC_CPUC_SED_DR_16_0012029	Schwecke, Rodger <rschwecke@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/26/2016 13:22
165	AC_CPUC_SED_DR_16_0023460	Schwecke, Rodger <rschwecke@enova.com>	Ng, Deana M <DNg@semprautilities.com>			5/24/2016 16:25
167	AC_CPUC_SED_DR_16_0012085	RSchwecke@semprautilities.com	La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/26/2016 13:22

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
168	AC_CPUC_SED_DR_16_0025263	Schwecke, Rodger <rschwecke@enova.com>	Lane, Bret (JLane@semprautilities.com)	Tomkins, Sharon <STomkins@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 13:48
172		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:13
173		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:09
174		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47
175						4/18/2016 6:47
176						4/18/2016 6:47
177						4/18/2016 6:47
178						4/18/2016 6:47
179		Van de Putte, Todd <TVandePutte@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
180		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50
181		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			4/4/2016 11:40
183		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:50
184		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:41
185		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:09
186		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42
187						9/1/2016 15:42
188						9/1/2016 15:42
189		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
190						9/1/2016 15:41
191						9/1/2016 15:41
192						9/1/2016 15:41
193		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41
194						9/1/2016 15:41
195						9/1/2016 15:41
196						9/1/2016 15:41
197		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40
198						9/1/2016 15:40

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
199						9/1/2016 15:40
200						9/1/2016 15:40
201		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38
202						9/1/2016 15:38
203						9/1/2016 15:38
204						9/1/2016 15:38
205						9/1/2016 15:38
206						9/1/2016 15:38
207		Tracy, Jill <jtracy@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
208						9/6/2016 10:35
210		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:49
211		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:40
212		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		9/2/2016 9:43
213		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54
214						9/1/2016 13:54
217		Unspecified Sender	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35
218						9/6/2016 10:35
220		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:49

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
221		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:40
222		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)		9/2/2016 9:43
223		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54
224						9/1/2016 13:54
225	AC_CPUC_SED_DR_16_0012354	Tracy, Jill <jtracy@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 13:45
226	AC_CPUC_SED_DR_16_0012356	JTracy@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 13:44
227	AC_CPUC_SED_DR_16_0012523	Van de Putte, Todd <tvandepu@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>			5/26/2016 13:40
232		Van de Putte, Todd <tvandepu@enova.com>	'rhatteberg@boots-coots.com'			4/18/2016 8:45
233						4/18/2016 8:45

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
234						4/18/2016 8:45
235						4/18/2016 8:45
236						4/18/2016 8:45
237		Unspecified Sender	rhatteberg@boots-coots.com			4/18/2016 8:45
238						4/18/2016 8:45
239						4/18/2016 8:45
240						4/18/2016 8:45
241						4/18/2016 8:45
246		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Richard Hatteberg <rhatteberg@boots-coots.com>		4/18/2016 7:41

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
247		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:13
248		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:13
249		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47
250						4/18/2016 6:47
251						4/18/2016 6:47
252						4/18/2016 6:47
253						4/18/2016 6:47
254		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47
255						4/18/2016 6:47

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
256						4/18/2016 6:47
257						4/18/2016 6:47
258						4/18/2016 6:47
259		Van de Putte, Todd <tvandepu@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32
260		Unspecified Sender	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32
261		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rubin, Jonathan <JRubin@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/5/2016 13:30
262		Rubin, Jonathan <JRubin@semprautilities.com>	'jim.lagrone@boots-coots.com'; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/5/2016 11:53
263	AC_CPUC_SED_DR_16_0012566	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13
264	AC_CPUC_SED_DR_16_0012570	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
265	AC_CPUC_SED_DR_16_0012575	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17
266	AC_CPUC_SED_DR_16_0012579	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17
267	AC_CPUC_SED_DR_16_0012583	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43
268	AC_CPUC_SED_DR_16_0012586	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43
269	AC_CPUC_SED_DR_16_0012590	Hesam, H. Tony <Thesam@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		4/4/2016 16:08
270	AC_CPUC_SED_DR_16_0012593	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31
271	AC_CPUC_SED_DR_16_0012596	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31
272		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50
273		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
274		Rubin, Jonathan <JRubin@sempra utilities.com>	'jim.lagrone@boots-coots.com'; Hassan, Kim <KHassan@sempra utilities.com>	Talley, Kendra <KTalley@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>		4/4/2016 11:27
275	AC_CPUC_SED_DR_16_0012599	Hesam, H. Tony <Thesam@sempra utilities.com>	Navin, Neil <NNavin@sempra utilities.com>; Chechitelli, Frank <FChechitelli@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Greenwade, Lynn N. <LNGreenwade@sempra utilities.com>; Hobbs, Rick <RHobbs@sempra utilities.com>; Langan, Ken <KLangan@sempra utilities.com>; Sanders, Cole B <CSanders2@sempra utilities.com>; Lee, Karen I <KLee5@sempra utilities.com>		4/4/2016 9:46
276		Haley McIntosh <hmmcintosh@jonesday.com>	mdozier@sempra utilties.com	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; Ng, Deana M <DNg@sempra utilities.com>; Mortazavi, Setareh <SMortazavi@sempra utilities.com>; Healy, Gregory <GHealy@sempra utilities.com>		8/18/2016 14:00
277						8/18/2016 14:00
278						8/18/2016 14:00
279		Haley McIntosh <hmmcintosh@jonesday.com>	jim.lagrone@boots-coots.com	Van de Putte, Todd <TVandePutte@sempra utilities.com>; Healy, Gregory <GHealy@sempra utilities.com>; Mortazavi, Setareh <SMortazavi@sempra utilities.com>		8/18/2016 10:40
280						8/18/2016 10:40
281	AC_CPUC_SED_DR_16_0012764	Navin, Neil <NNavin@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>			4/5/2016 8:56
282	AC_CPUC_SED_DR_16_0012768	Navin, Neil <NNavin@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>			4/5/2016 7:56

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283	AC_CPUC_SED_DR_16_0025626	Healy, Gregory <GHealy@semprautilities.com>	Mortazavi, Setareh <SMortazavi@semprautilities.com>; Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>			6/30/2017 15:36
298	AC_CPUC_SED_DR_16_0013403	Navin, Neil <nnavin@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 8:56
299	AC_CPUC_SED_DR_16_0013407	NNavin@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 8:56
300	AC_CPUC_SED_DR_16_0013411	Navin, Neil <nnavin@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 7:56
301	AC_CPUC_SED_DR_16_0013415	NNavin@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 7:56
304	AC_CPUC_SED_DR_16_0013467	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13
305	AC_CPUC_SED_DR_16_0013471	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17
306	AC_CPUC_SED_DR_16_0013475	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43
307	AC_CPUC_SED_DR_16_0013478	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
308	AC_CPUC_SED_DR_16_0013500	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			1/17/2016 16:24
309	AC_CPUC_SED_DR_16_0013535	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13
310	AC_CPUC_SED_DR_16_0013539	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17
311	AC_CPUC_SED_DR_16_0013543	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43
312	AC_CPUC_SED_DR_16_0013546	Hesam, H. Tony <Thesam@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		4/4/2016 16:08
313	AC_CPUC_SED_DR_16_0013549	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31
314	AC_CPUC_SED_DR_16_0013552	Hesam, H. Tony <Thesam@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 9:46
315	AC_CPUC_SED_DR_16_0013579	Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 11:44
316	AC_CPUC_SED_DR_16_0013581	Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 8:40

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
318	AC_CPUC_SED_DR_16_0013704	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>			6/13/2016 7:44
319	AC_CPUC_SED_DR_16_0013707	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>			6/13/2016 7:44
320	AC_CPUC_SED_DR_16_0013710	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:33
321	AC_CPUC_SED_DR_16_0013712	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:32
324	AC_CPUC_SED_DR_16_0013730	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Healy, Gregory <GHealy@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>; 'Haley McIntosh' <hmmcintosh@jonesday.com>		6/10/2016 13:23
325	AC_CPUC_SED_DR_16_0013733	Unspecified Sender	Healy, Gregory <GHealy@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>; Haley McIntosh <hmmcintosh@jonesday.com>		6/10/2016 13:23
326	AC_CPUC_SED_DR_16_0023592	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 12:58
327	AC_CPUC_SED_DR_16_0023595	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 12:58
328	AC_CPUC_SED_DR_16_0023598	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 8:04

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
329	AC_CPUC_SED_DR_16_0023600	Unspecified Sender	Cardiff, Steven G <SCardiff@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 8:04
330	AC_CPUC_SED_DR_16_0023602	Cardiff, Steven G <SCardiff@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 18:02
331	AC_CPUC_SED_DR_16_0013742	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:58
332	AC_CPUC_SED_DR_16_0013766	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:55
333	AC_CPUC_SED_DR_16_0023604	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:50
334	AC_CPUC_SED_DR_16_0023606	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:50
335	AC_CPUC_SED_DR_16_0013809	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/13/2016 10:11
336	AC_CPUC_SED_DR_16_0013812	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:52
337	AC_CPUC_SED_DR_16_0023611	Haley McIntosh <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 11:56

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
338	AC_CPUC_SED_DR_16_0023614	Frescas, Arturo <AFrescas@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Cardiff, Steven G <SCardiff@semprautilities.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>		6/10/2016 10:50
339	AC_CPUC_SED_DR_16_0023616	Cardiff, Steven G <SCardiff@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 9:13
340	AC_CPUC_SED_DR_16_0023618	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 17:11
342		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59
343		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57
344		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>; Arash Haghshenas <arash@boots-coots.com>			4/14/2016 13:31
345		Unspecified Sender	'Arash Haghshenas' <arash@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 12:54
346						4/14/2016 12:54
347						4/14/2016 12:54

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348						4/14/2016 12:54
349						4/14/2016 12:54
350						4/14/2016 12:54
351						4/14/2016 12:54
352						4/14/2016 12:54
353						4/14/2016 12:54
354						4/14/2016 12:54
355						4/14/2016 12:54
356						4/14/2016 12:54

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357						4/14/2016 12:54
358						4/14/2016 12:54
359						4/14/2016 12:54
360		Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>		4/19/2016 9:09
361		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 14:05
362		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:58
363		Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:50
364		Hassan, Kim <KHassan@semprautilities.com>	Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		4/14/2016 13:25
365		Arash Haghshenas <arash@boots-coots.com>	Hassan, Kim <KHassan@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:14

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
366		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Arash Haghshenas <arash@boots-coots.com>		4/14/2016 12:57
367	AC_CPUC_SED_DR_16_0015866	Howes, Marlin E. <MHowes@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			11/21/2015 10:02
368		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59
369		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57
370		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>; Arash Haghshenas <arash@boots-coots.com>			4/14/2016 13:31
371		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Arash Haghshenas' <arash@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 12:54
372						4/14/2016 12:54
373						4/14/2016 12:54
374						4/14/2016 12:54

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375						4/14/2016 12:54
376						4/14/2016 12:54
377						4/14/2016 12:54
378						4/14/2016 12:54
379						4/14/2016 12:54
380						4/14/2016 12:54
381						4/14/2016 12:54
382						4/14/2016 12:54
383						4/14/2016 12:54

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384						4/14/2016 12:54
385						4/14/2016 12:54
386	AC_CPUC_SED_DR_16_0016231	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:57
387	AC_CPUC_SED_DR_16_0016233	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:12
388	AC_CPUC_SED_DR_16_0016551	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 11:12
389	AC_CPUC_SED_DR_16_0016556	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 8:43
390	AC_CPUC_SED_DR_16_0016733	Unspecified Sender	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 8:46
391	AC_CPUC_SED_DR_16_0025018	Kundly, Christine M <CKundly@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			12/15/2015 14:06
392	AC_CPUC_SED_DR_16_0016751	Healy, Gregory <GHealy@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>			12/10/2015 10:27

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397		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Rick Gentges <rgentges@rcp.com>; Elaine Froneberger <EFroneberger@rcp.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>		3/13/2017 9:08
398						3/13/2017 9:08
399	AC_CPUC_SED_DR_16_0025628	Healy, Gregory <GHealy@semprautilities.com>	Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>			8/17/2017 12:06
400	AC_CPUC_SED_DR_16_0023914	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 12:58
401	AC_CPUC_SED_DR_16_0023917	Cardiff, Steven G <sgcardif@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 9:13
402	AC_CPUC_SED_DR_16_0023919	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 8:04
403	AC_CPUC_SED_DR_16_0023921	Cardiff, Steven G <sgcardif@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 18:02
404	AC_CPUC_SED_DR_16_0023923	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 18:00
405	AC_CPUC_SED_DR_16_0023925	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:58

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406						6/9/2016 6:58
407						6/9/2016 6:58
408	AC_CPUC_SED_DR_16_0023947	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:50
411		Frescas, Arturo <AFrescas@semprautilities.com>	'Eliasian, Maghdi' <maghdi.eliasian@morganlewis.com>; Haley McIntosh <hmmcintosh@jonesday.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 12:40
412		Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>	Haley McIntosh <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 12:28
413		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50
415	AC_CPUC_SED_DR_16_0043333	Chechitelli, Frank <FChechitelli@semprautilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 9:45
420	AC_CPUC_SED_DR_16_0018120	Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32
423	AC_CPUC_SED_DR_16_0018140	Schwecke, Rodger <rschwecke@enova.com>	Ng, Deana M <DNg@semprautilities.com>			4/18/2016 7:36

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424	AC_CPUC_SED_DR_16_0018206	Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32
425	AC_CPUC_SED_DR_16_0043349	Tracy, Jill <JTracy@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:20
426	AC_CPUC_SED_DR_16_0018215	Navin, Neil <NNavin@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/5/2016 21:49
427	AC_CPUC_SED_DR_16_0018217	Navin, Neil <NNavin@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 14:38
428	AC_CPUC_SED_DR_16_0018220	Navin, Neil <NNavin@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 8:33
429		Van de Putte, Todd <tvandepu@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44
430		Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44
431	AC_CPUC_SED_DR_16_0018269	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/6/2016 6:30
432	AC_CPUC_SED_DR_16_0018272	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/6/2016 6:30

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433	AC_CPUC_SED_DR_16_0018275	Chechitelli, Frank <FChechitelli@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/5/2016 17:48
434	AC_CPUC_SED_DR_16_0018277	Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 7:59
435		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50
436		Unspecified Sender	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50
437	AC_CPUC_SED_DR_16_0018287	Navin, Neil <NNavin@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32
438		Van de Putte, Todd <TVandePutte@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44
439		Navin, Neil <NNavin@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:42
440	AC_CPUC_SED_DR_16_0018311	Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32
445	AC_CPUC_SED_DR_16_0025514	Navin, Neil <nnavin@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>			7/1/2016 10:53

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446	AC_CPUC_SED_DR_16_0025523	Schwecke, Rodger <RSchwecke@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 10:47
447	AC_CPUC_SED_DR_16_0025525	Neville, Dan <DNeville@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 10:34
448	AC_CPUC_SED_DR_16_0025527	Schwecke, Rodger <RSchwecke@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/10/2016 9:36
449	AC_CPUC_SED_DR_16_0025528	Schwecke, Rodger <rschwecke@enova.com>	Kitson,Amy <AKitson@semprautilities.com>	Neville,Dan <DNeville@semprautilities.com>; Navin,Neil <NNavin@semprautilities.com>		12/10/2016 9:35
450	AC_CPUC_SED_DR_16_0025530	Kitson, Amy <AKitson@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/9/2016 20:38
451	AC_CPUC_SED_DR_16_0025531	Neville, Dan <DNeville@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 19:30
452	AC_CPUC_SED_DR_16_0025532	Schwecke, Rodger <RSchwecke@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 17:43
453	AC_CPUC_SED_DR_16_0018361	Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 7:59
454		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>		5/22/2017 6:58

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
455		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:58
456		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:29
457		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 12:39
458		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/11/2017 14:36
459		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:50
460		Kitson, Amy <awahl@enova.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40
461		Kitson, Amy <awahl@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:38
462		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			5/11/2017 7:40
463		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
464		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		5/2/2017 11:49
465		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 10:05
466	AC_CPUC_SED_DR_16_0025577	Neville, Dan <tpdgn@enova.com>	Egbert, Thomas <TEgbert@semprautilities.com>			1/5/2017 8:46
467	AC_CPUC_SED_DR_16_0025580	Unspecified Sender	Egbert, Thomas <TEgbert@semprautilities.com>			1/5/2017 8:46
468	AC_CPUC_SED_DR_16_0025583	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>			12/21/2016 14:25
469	AC_CPUC_SED_DR_16_0025585	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>			12/21/2016 14:24
470	AC_CPUC_SED_DR_16_0025594	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 13:39
471	AC_CPUC_SED_DR_16_0025598	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 13:39
472	AC_CPUC_SED_DR_16_0025602	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:54

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
473	AC_CPUC_SED_DR_16_0025605	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:53
474	AC_CPUC_SED_DR_16_0025608	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:34
475	AC_CPUC_SED_DR_16_0025610	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:34
476	AC_CPUC_SED_DR_16_0025612	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 18:30
477	AC_CPUC_SED_DR_16_0025613	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 18:30
478	AC_CPUC_SED_DR_16_0025616	Egbert, Thomas <TEgbert@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>			1/5/2017 8:47
479		Jim LaGrone <Jim.LaGrone@boots-coots.com>	ndodoo@semprautiliteis.com	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; John Garner <Jgarner@boots-coots.com>		3/15/2017 12:51
480						3/15/2017 12:51
481		Van de Putte, Todd <tvandepu@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 9:32

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
482		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 9:26
484		Navin, Neil <nnavin@enova.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44
485		Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40
486	AC_CPUC_SED_DR_16_0024108	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:12
487	AC_CPUC_SED_DR_16_0024110	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:12
488	AC_CPUC_SED_DR_16_0024112	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:12
489	AC_CPUC_SED_DR_16_0024114	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:11
490	AC_CPUC_SED_DR_16_0024116	Logan, David M <DLogan@sempra.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			12/1/2017 9:07
491	AC_CPUC_SED_DR_16_0024117	Logan, David M <DLogan@sempra.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			11/30/2017 21:37

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
492	AC_CPUC_SED_DR_16_0019261	Razavi, Avideh <arazavi1@enova.com>	Mortazavi, Setareh <SMortazavi@semprautilities.com>			12/21/2017 14:13
493		Navin, Neil <NNavin@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44
494		Dodoo, Nii Amoo <dnamoo@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36
495		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Jim.LaGrone@boots-coots.com; Rolando.Gomez@boots-coots.com	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>; Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/3/2017 8:24
496		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Sharepoint <Sharepoint@semprautilities.com>; SempraHelp <SempraHelp@sempra.com>	Tran, Johnny Q <JQTran@semprautilities.com>; Cerrillos, Jorge <JCerrillos@semprautilities.com>; mmunoz@boots-coots.com		7/18/2017 6:36
497		Cerrillos, Jorge <tpjsc@enova.com>	Miguel Munoz <mmunoz@boots-coots.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		7/13/2017 14:56
498						7/13/2017 14:56
499		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/12/2017 6:46
500						7/12/2017 6:46

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
501		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/12/2017 6:39
502						7/12/2017 6:39
503		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/11/2017 6:41
504						7/11/2017 6:41
505		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	mmunoz@boots-coots.com	Cerrillos, Jorge <JCerrillos@semprautilities.com>		6/13/2017 8:13
506		Cerrillos, Jorge <tpjsc@enova.com> - on behalf of - Egan, Jason W <jwegan@enova.com>	mmunoz@boots-coots.com			6/1/2017 18:57
507		JCerrillos@semprautilities.com	mmunoz@boots-coots.com			6/1/2017 18:57
508		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			6/1/2017 18:56
509		Cerrillos, Jorge <tpjsc@enova.com>	Miguel Munoz <mmunoz@boots-coots.com>			6/1/2017 18:54

Doc #	Prod Beg CPUC DR 16	Email From	Email To	Email CC	Email BCC	Parent Date
510		JCerrillos@semprautilities.com	Miguel Munoz <mmunoz@boots-coots.com>			6/1/2017 18:54
511		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 9:01
512		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 8:59
513		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			5/26/2017 8:58

SoCalGas Supplemental Response to CPUC-SED Data Request Dated February 12, 2018

Reply | Reply All | Forward | ...

HG

Healy, Gregory <GHealy@semprautilities.com>

To Holter, Randy

Cc Bruno, Kenneth; Sher, Nicholas; Gruen, Darryl; Clorfeine, Sabina B.

Mon 3/5/2018 5:59 PM

CPUC-SED DR 021218 30518.pdf
135 KB

Confidentiality Declaration - CPUC-SED DR 021218 30518.pdf
150 KB

CPUC-SED Request Privilege Log Final PDF_3.5.18.pdf
318 KB

Attached please find SoCalGas' supplemental response to the February 12, 2018 dated data request from the CPUC- Safety and Enforcement Division related to the preliminary investigation regarding the Aliso Canyon well leak, and the accompanying privilege log and confidentiality declaration. Due to the size of the referenced attachments, the attachments will be provided in six parts via our Electronic Data Transfer (EDT) platform which will provide you a link to download the files.

Please note that the attached information contains confidential and protected materials submitted pursuant to PUC Section 583, GO 66-D, and D.17-09-023.

Let me know if you have any questions. Thanks.

Gregory Healy
Regulatory Case Manager
Southern California Gas Company
PH: (213) 244-3314
ghealy@semprautilities.com

SoCalGas Supplemental Response to SED Data Request 16

Reply | Reply All | Forward | ...

Fri 3/15/2019 7:41 PM

HG

Healy, Gregory <GHealy@semprautilities.com>

To Holter, Randy

Cc Bruno, Kenneth; Sher, Nicholas; Gruen, Darryl; Clorfeine, Sabina B.

You forwarded this message on 11/11/2019 2:19 PM.

- SoCalGas' Supplemental Response to SED DR 16 031519.pdf — 113 KB
- Confidentiality Declaration - Supplemental Response to SED 16 031519.pdf — 112 KB
- SED 16 Supplement.zip — 3 MB
- Revised SED DR 16 Privilege Log (3-15-2019).pdf — 114 KB
- SED Data Request List.xlsx

Attached please find SoCalGas' supplemental response to SED Data Request 16 dated February 12, 2018. Please note that the attached information contains confidential and protected materials submitted pursuant to PUC Section 583, GO 66-D, and D.17-09-023.

SoCalGas has also attached an updated SED Data Request List and an updated privilege log for SED Data Request 16 based on the enclosed response.

Please let me know if you have any questions. Thanks.

Gregory Healy
Regulatory Case Manager
Southern California Gas Company
PH: (213) 244-3314
ghealy@semprautilities.com

SoCalGas Response to SED Data Request 17

HG
Healy, Gregory <GHealy@semprautilities.com>
To Holter, Randy
Cc Bruno, Kenneth; Sher, Nicholas; Gruen, Darryl; Clorfeine, Sabina B.

Reply | Reply All | Forward | ...

Thu 5/24/2018 5:57 PM

You forwarded this message on 6/3/2020 10:43 AM.

- CPUC SED 17-8.pdf 151 KB
- Confidentiality Declaration - SED 17-8.pdf 111 KB
- SED DR 17 Privilege Log 5.24.18.pdf 676 KB
- SED DR 16 Privilege Log 5.24.18.pdf 525 KB
- SED Data Request List.xlsx 22 KB

Attached please find SoCalGas' additional response to SED Data Request 17 dated March 30, 2018. Due to the size of the referenced attachments they will be provided via a thumb drive in a separate communication. Please note that the attached information contains confidential and protected materials submitted pursuant to PUC Section 583, GO 66-D, and D.17-09-023. In addition, please find the privilege logs for SED Data Request 16 and 17.

SoCalGas has also attached an updated SED Data Request List based on the enclosed response.

Please let me know if you have any questions. Thanks.

Gregory Healy
Regulatory Case Manager
Southern California Gas Company
PH: (213) 244-3314
ghealy@semprautilities.com

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-64 DATED APRIL 6, 2020)

SOCALGAS SUPPLEMENTAL RESPONSE DATED MAY 15, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 6, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

Please refer to the following passages in the testimony of Mr. Gregory Healy for this next set of questions.

QUESTION 2:

On page 7, it states, "SED's Opening Testimony alleges that SoCalGas committed 226 violations [footnote omitted) by initially withholding documents from and later supplementing its response to SED's Data Request No. 16 (SED DR 16). . .SoCalGas initially withheld these referenced documents on the basis of the attorney-client communication privilege and/or attorney work product doctrine, but later de-designated and produced the documents.

SED claims that this initial withholding and subsequent release constitute violations of Section 451 because "[the withholding] delayed SED's ability to get this information as part of its preformal investigation". [Footnote omitted.]. SED further claims this conduct constitutes a Rule 1.1 violation because "SoCalGas represented to SED that these items were protected by attorneyclient or attorney work product privilege, when they were not. [Footnote omitted]. SED alleges these violations began the day SoCalGas initially asserted the privilege and continued until SoCalGas released the documents. [Footnote omitted.]

However, SED's assertions ignore several significant considerations: (a) the complexity and volume of records reviewed in the process of responding to SED's data request, (b) that SoCalGas was transparent in its discovery responses and appropriately qualified that they were subject to change, and (c) SED has also withdrawn assertions of privilege.

A. SoCalGas' Initial Review of Documents Was Long and Complex.

SoCalGas reviewed over 8,000 documents in the course of responding to SED DR 16, which broadly sought "any and all communications . . . between SoCalGas and Boots and Coots" over a period of two years. This iterative review was conducted by several attorneys over the course of several weeks and culminated in the production of over 5,000 documents, totaling nearly 20,000 pages, and the preparation of iterative privilege logs, the first of which was over 180 pages and listed over 900 documents."

B. SoCalGas Expressly Qualified Its Responses and Appropriately Supplemented Its Production to SED

SoCalGas' initial and supplemental responses to SED expressly informed SED that SoCalGas' responses were based on the best available information and potentially subject to further supplementation. For example, SoCalGas' March 5, 2018 response to SED DR 16 made clear that its responses were "based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control." [Footnote omitted.] SoCalGas further stated that its responses were subject to supplementation, amendment and correction. [Footnote omitted.] . . .

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-64 DATED APRIL 6, 2020)

SOCALGAS SUPPLEMENTAL RESPONSE DATED MAY 15, 2020

SoCalGas revisited the documents listed on its privilege log and determined that it could de-designate certain of the documents. Based on this additional review, SoCalGas produced additional documents, with the latest production submitted on March 15, 2019, over eight (8) months before SED served its Opening Testimony. [Footnote omitted.]. SED has not alleged that any of the documents contained in the de-designated sets were in any way material to its investigation or were relied upon for any purpose other than to allege 226 violations against SoCalGas. [Footnotes omitted.]

With the above passages in mind, with regards to the privilege log in response to Data Request 16, please answer:

> a. Does SoCalGas continue to assert attorney client privilege over all of the communications on the most up to date privilege log in response to SED Data Request 16?
> b. If not, please turn over the communications over which SoCalGas no longer asserts attorney-client privilege.
> c. For those communications over which SoCalGas continues to assert attorney-client privilege, will SoCalGas stipulate to the following:
>
> > a. A declaration that there is a valid legal basis under current statutory and case law to assert attorney-client privilege over each of these communications?
> > b. An in-camera review by the Administrative Law Judges of the instant proceeding to determine whether the communications are validly protected by attorney-client privilege?

<u>RESPONSE 2 (Dated April 27, 2020):</u>

a. No. SoCalGas will be de-designating additional communications from the privilege log most recently produced to SED on March 15, 2019, in response to SED Data Request 16.
b. SoCalGas is preparing the documents and will provide them in a supplemental response the week of May 4, 2020.
c. SoCalGas objects to this request to the extent it does not seek information of a factual nature that is appropriate for discovery.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-64 DATED APRIL 6, 2020)

SOCALGAS SUPPLEMENTAL RESPONSE DATED MAY 15, 2020

SUPPLEMENTAL RESPONSE 2.b (Dated May 15, 2020):

Please see electronic documents with Bates range:
I1906016_SCG_SED_DR_64_0000001 – I1906016_SCG_SED_DR_64_0001208.

An updated privilege log is also included in this response.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-64 DATED APRIL 6, 2020)

SOCALGAS RESPONSE DATED APRIL 27, 2020

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated April 6, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

Please refer to the following passages in the testimony of Mr. Gregory Healy for this next set of questions.

QUESTION 2:

On page 7, it states, "SED's Opening Testimony alleges that SoCalGas committed 226 violations [footnote omitted) by initially withholding documents from and later supplementing its response to SED's Data Request No. 16 (SED DR 16). . .SoCalGas initially withheld these referenced documents on the basis of the attorney-client communication privilege and/or attorney work product doctrine, but later de-designated and produced the documents.

SED claims that this initial withholding and subsequent release constitute violations of Section 451 because "[the withholding] delayed SED's ability to get this information as part of its preformal investigation". [Footnote omitted.]. SED further claims this conduct constitutes a Rule 1.1 violation because "SoCalGas represented to SED that these items were protected by attorneyclient or attorney work product privilege, when they were not. [Footnote omitted]. SED alleges these violations began the day SoCalGas initially asserted the privilege and continued until SoCalGas released the documents. [Footnote omitted.]

However, SED's assertions ignore several significant considerations: (a) the complexity and volume of records reviewed in the process of responding to SED's data request, (b) that SoCalGas was transparent in its discovery responses and appropriately qualified that they were subject to change, and (c) SED has also withdrawn assertions of privilege.

A. SoCalGas' Initial Review of Documents Was Long and Complex.

SoCalGas reviewed over 8,000 documents in the course of responding to SED DR 16, which broadly sought "any and all communications . . . between SoCalGas and Boots and Coots" over a period of two years. This iterative review was conducted by several attorneys over the course of several weeks and culminated in the production of over 5,000 documents, totaling nearly 20,000 pages, and the preparation of iterative privilege logs, the first of which was over 180 pages and listed over 900 documents."

B. SoCalGas Expressly Qualified Its Responses and Appropriately Supplemented Its Production to SED

SoCalGas' initial and supplemental responses to SED expressly informed SED that SoCalGas' responses were based on the best available information and potentially subject to further supplementation. For example, SoCalGas' March 5, 2018 response to SED DR 16 made clear that its responses were "based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control." [Footnote omitted.] SoCalGas further stated that its responses were subject to supplementation, amendment and correction. [Footnote omitted.] . . .

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-64 DATED APRIL 6, 2020)

SOCALGAS RESPONSE DATED APRIL 27, 2020

SoCalGas revisited the documents listed on its privilege log and determined that it could de-designate certain of the documents. Based on this additional review, SoCalGas produced additional documents, with the latest production submitted on March 15, 2019, over eight (8) months before SED served its Opening Testimony. [Footnote omitted.]. SED has not alleged that any of the documents contained in the de-designated sets were in any way material to its investigation or were relied upon for any purpose other than to allege 226 violations against SoCalGas. [Footnotes omitted.]

With the above passages in mind, with regards to the privilege log in response to Data Request 16, please answer:

> a. Does SoCalGas continue to assert attorney client privilege over all of the communications on the most up to date privilege log in response to SED Data Request 16?
> b. If not, please turn over the communications over which SoCalGas no longer asserts attorney-client privilege.
> c. For those communications over which SoCalGas continues to assert attorney-client privilege, will SoCalGas stipulate to the following:
>
> > a. A declaration that there is a valid legal basis under current statutory and case law to assert attorney-client privilege over each of these communications?
> > b. An in-camera review by the Administrative Law Judges of the instant proceeding to determine whether the communications are validly protected by attorney-client privilege?

<u>RESPONSE 2:</u>

a. No. SoCalGas will be de-designating additional communications from the privilege log most recently produced to SED on March 15, 2019, in response to SED Data Request 16.
b. SoCalGas is preparing the documents and will provide them in a supplemental response the week of May 4, 2020.
c. SoCalGas objects to this request to the extent it does not seek information of a factual nature that is appropriate for discovery.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1		Unspecified Sender	Arash Haghshenas <arash@boots-coots.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>			2/4/2016 10:05	Email sent internally reflecting legal advice regarding gas standards.
2		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Egbert, Thomas <TEgbert@semprautilities.com>	'Arash Haghshenas' <arash@boots-coots.com>		2/8/2016 9:34	Email sent internally reflecting legal advice regarding company response to agency data requests.
3		Arash Haghshenas <arash@boots-coots.com>	Egbert, Thomas <TEgbert@semprautilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>			2/4/2016 9:44	Email sent internally reflecting legal advice regarding gas standards.
4	AC_CPUC_0172483	Healy, Gregory <tpghh@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>			12/10/2015 11:07	Email sent internally reflecting legal advice regarding company response to agency data requests.
5	AC_CPUC_0165768	Kundly, Christine M <CKundly@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		12/15/2015 21:17	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
6	AC_CPUC_0165763	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 16:45	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
7	AC_CPUC_0165758	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:28	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
8	AC_CPUC_0165754	Kitson, Amy <AKitson@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
9	AC_CPUC_0165750	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
10	AC_CPUC_0165746	Gates, Beth A. <BAGates@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			12/15/2015 15:06	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
11	AC_CPUC_0165736	La Fevers, Glenn <glafever@enova.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 15:04	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
12	AC_CPUC_0165731	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 15:02	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
13	AC_CPUC_0165726	La Fevers, Glenn <glafever@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>			12/15/2015 15:00	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
14	AC_CPUC_0165722	Chechitelli, Frank <FChechitelli@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:35	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
15	AC_CPUC_0165718	Kundly, Christine M <CKundly@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>		12/15/2015 14:33	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
16	AC_CPUC_0165710	La Fevers, Glenn <glafever@enova.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
17	AC_CPUC_0165703	Kitson, Amy <AKitson@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		12/15/2015 14:03	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
18	AC_CPUC_0165699	Kundly, Christine M <CKundly@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>		12/15/2015 13:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
19		Nancy.Renteria@LW.com	lportillo@boots-coots.com	Michael.Romey@LW.com; La Fevers, Glenn <GLaFevers@semprautilities.com>; Howes, Marlin E. <MHowes@semprautilities.com>		11/12/2015 16:04	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
20						11/12/2015 16:04	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
21		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Arriola, Dennis <DArriola@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		1/5/2016 11:22	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
22						1/5/2016 11:22	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
23						1/5/2016 11:22	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
24						1/5/2016 11:22	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
25						1/5/2016 11:22	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
26		Snyder, Hal <HSnyder@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		1/3/2016 8:58	Email sent internally reflecting legal advice regarding company response to agency data requests.
27		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Bud Curtis <bcurtis@boots-coots.com>		1/3/2016 5:42	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
28						1/3/2016 5:42	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
29	AC_CPUC_0174272	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			12/29/2015 8:46	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
30		John Hatteberg <jhatteberg@boots-coots.com>	Wayne Courville <Wayne.Courville@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
31						12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
32						12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
33						12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
34						12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
35						12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
36						12/21/2015 10:11	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
37		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:57	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
38		John Hatteberg <jhatteberg@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
39		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:12	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
40	AC_CPUC_0173437	Kerns, Barry <BKerns@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		12/19/2015 7:33	Email sent internally reflecting legal advice regarding company response to agency data requests.
41	AC_CPUC_0165786	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>			12/16/2015 5:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
42	AC_CPUC_0172250	Schwecke, Rodger <RSchwecke@semprautilities.com>	Danny Walzel <dwalzel@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/9/2015 6:12	Email sent internally reflecting legal advice regarding company response to agency data requests.
43		Van de Putte, Todd <tvandepu@enova.com>	'Don Shackelford' <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/12/2016 8:46	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
44		Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/12/2016 8:23	Email sent internally reflecting legal advice regarding company response to agency data requests.
45	AC_CPUC_0165872	Chris Yeung <Chris.Yeung@Halliburton.com>	Don Shackelford <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:39	Email sent internally reflecting legal advice regarding company response to agency data requests.
46	AC_CPUC_0165869	Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@semprautilities.com>; Chris Yeung <Chris.Yeung@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:36	Email sent internally reflecting legal advice regarding company response to agency data requests.
47	AC_CPUC_0165863	Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@semprautilities.com>			2/10/2016 12:31	Email sent internally reflecting legal advice regarding company response to agency data requests.
48	AC_CPUC_0165860	Lane, Bret <JLane@semprautilities.com>	Chris Yeung <Chris.Yeung@Halliburton.com>; Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:20	Email sent internally reflecting legal advice regarding company response to agency data requests.
49	AC_CPUC_0165854	Lane, Bret <JLane@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/10/2016 12:19	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
50	AC_CPUC_0165851	Lane, Bret <JLane@semprautilities.com>	Chris Yeung <Chris.Yeung@Halliburton.com>; Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:16	Email sent internally reflecting legal advice regarding company response to agency data requests.
51	AC_CPUC_0165534	Chris Yeung <Chris.Yeung@Halliburton.com>	Don Shackelford <donwshackelford@yahoo.com>; Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Bryce Hinsch <Bryce.Hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 12:02	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
52	AC_CPUC_0165530	Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Chris Yeung <chris.yeung@halliburton.com>; Bryce Hinsch <bryce.hinsch@halliburton.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
53	AC_CPUC_0165850	Lane, Bret <JLane@semprautilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/10/2016 11:02	Email sent internally reflecting legal advice regarding company response to agency data requests.
54	AC_CPUC_0165847	Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/9/2016 8:49	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
55	AC_CPUC_0165844	Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@sempra utilities.com>; Don Schackelford <donwshackelford@yahoo.com>			2/8/2016 18:26	Email sent internally reflecting legal advice regarding company response to agency data requests.
56	AC_CPUC_0165837	Lane, Bret <JLane@sempra utilities.com>	Don Schackelford <donwshackelford@yahoo.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>			2/8/2016 18:19	Email sent internally reflecting legal advice regarding company response to agency data requests.
57		Lane, Bret <JLane@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>		2/7/2016 13:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
58						2/7/2016 13:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
59		Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@sempra utilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>			2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
60						2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
61						2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
62						2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
63						2/7/2016 11:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
64		Don Shackelford <donwshackelford@yahoo.com>	Lane, Bret <JLane@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempra utilities.com>		2/6/2016 10:30	Email sent internally reflecting legal advice regarding company response to agency data requests.
65		Van de Putte, Todd <tvandepu@enova.com>	Lane, Bret <JLane@sempra utilities.com>	Don Shackelford <donwshackelford@yahoo.com>		2/5/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
66						2/5/2016 11:49	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
67		Don Shackelford <donwshackelford@yahoo.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/1/2016 16:20	Email sent internally reflecting legal advice regarding company response to agency data requests.
68	AC_CPUC_0173234	JCho@semprautilities.com	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		12/18/2015 13:40	Email sent internally reflecting legal advice regarding company response to agency data requests.
69	AC_CPUC_0174443	Wagher, Ed <EWagher@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		12/29/2015 18:20	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
70	AC_CPUC_0173228	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>		12/18/2015 13:38	Email sent internally reflecting legal advice regarding company response to agency data requests.
71	AC_CPUC_0173212	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>		12/18/2015 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
72	AC_CPUC_0165809	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>			12/16/2015 5:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
73	AC_CPUC_0165741	La Fevers, Glenn <GLaFevers@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 15:04	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
74	AC_CPUC_0165714	La Fevers, Glenn <GLaFevers@semprautilities.com>	Kundly, Christine M <CKundly@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		12/15/2015 14:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
75	AC_CPUC_0172486	Healy, Gregory <GHealy@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>			12/10/2015 11:07	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
76	AC_CPUC_0172468	Kitson, Amy <AKitson@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>			12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
77						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
78						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
79						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
80						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
81						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
82						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
83						12/9/2015 15:36	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
84	AC_CPUC_0172520	Healy, Gregory <GHealy@semprautilities.com>	Salazar, Jeff <JLSalazar@semprautilities.com>			12/10/2015 11:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
85						12/10/2015 11:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
86						12/10/2015 11:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
87						12/10/2015 11:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
88		Schwecke, Rodger <rschwecke@enova.com>	De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; Kargar, Azra <AKargar@semprautilities.com>; Aftab, Nadia <NAftab@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			12/23/2015 17:52	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
89	AC_CPUC_0172252	Schwecke, Rodger <rschwecke@enova.com>	Danny Walzel <dwalzel@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/9/2015 6:12	Email sent internally reflecting legal advice regarding company response to agency data requests.
90	AC_CPUC_0178356	Sim, Michelle M <MSim@semprautilities.com>	Alexander, Lisa <LAlexander@semprautilities.com>	Kristjansson, Sue <SKristjansson@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		1/26/2016 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
91						1/26/2016 9:55	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
92	AC_CPUC_0175387	Arriola, Dennis <DArriola@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Alexander, Lisa <LAlexander@semprautilities.com>			1/6/2016 14:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
93						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
94						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
95						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
96						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
97						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
98						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
99						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
100						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
101						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
102						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
103						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
104						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
105						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
106						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
107						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
108						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
109						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
110						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
111						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
112						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
113						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
114						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
115						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
116						1/6/2016 14:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
117						1/6/2016 14:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
118						1/6/2016 14:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
119						1/6/2016 14:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
120						1/6/2016 14:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
121	AC_CPUC_0177955	Healy, Gregory <GHealy@semprautilities.com>	Shapiro, Daniel <DShapiro@semprautilities.com>			1/21/2016 16:03	Email sent internally reflecting legal advice regarding company response to agency data requests.
122		Navin, Neil <NNavin@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/8/2016 13:47	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
123		Cardiff, Steven G <SCardiff@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Danny Walzel <dwalzel@boots-coots.com>	Baker, Phil E. <PBaker@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>		12/4/2015 10:48	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
124						12/4/2015 10:48	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
125						12/4/2015 10:48	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
126						12/4/2015 10:48	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
127		Lane, Bret <tpjbl@enova.com>	Snyder, Hal <HSnyder@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/3/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
128						1/3/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
129						1/3/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
130						1/3/2016 8:54	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
131	AC_CPUC_0165814	Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I <JCho@semprautilities.com>			12/16/2015 5:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
132		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com> ; Danny Walzel <dwalzel@boots-coots.com>		11/30/2015 8:07	Email sent internally reflecting legal advice regarding company response to agency data requests.
133		Lane, Bret <tpjbl@enova.com>	Danny Clayton <dclayton@boots-coots.com>; Danny Walzel <dwalzel@boots-coots.com>			11/22/2015 8:43	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
134						11/22/2015 8:43	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
135		Lane, Bret <tpjbl@enova.com>	Danny Walzel <dwalzel@boots-coots.com>; Danny Clayton <dclayton@boots-coots.com>			11/17/2015 8:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
136						11/17/2015 8:05	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
137		John Hatteberg <jhatteberg@boots-coots.com>	Sylvia Estrada <Sylvia.Estrada@halliburton.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Lane, Bret <JLane@semprautilities.com>; Leonardo Portillo <lportillo@boots-coots.com>; Monica Williamson <Monica.Williamson@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/7/2015 11:15	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
138						12/7/2015 11:15	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
139						12/7/2015 11:15	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
140						12/7/2015 11:15	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
141		JLane@semprautilities.com	Snyder, Hal <HSnyder@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/3/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
142						1/3/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
143						1/3/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
144						1/3/2016 8:53	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
145	AC_CPUC_0165819	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>	Tomkins, Sharon <STomkins@semprautilities.com>		2/8/2016 5:36	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
146		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
147						2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
148		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
149						2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
150		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
151						2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
152		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
153						2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
154		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
155						2/4/2016 10:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
156	AC_CPUC_0179686	Schwecke, Rodger <RSchwecke@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>		1/31/2016 19:02	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
157	AC_CPUC_0179684	Cho, Jimmie I <jicho@enova.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/31/2016 18:43	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
158	AC_CPUC_0177160	Lane, Bret <JLane@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Arriola, Dennis <DArriola@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>			1/17/2016 10:50	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
159	AC_CPUC_0165804	Cho, Jimmie I <jicho@enova.com>	Lane, Bret <JLane@semprautilities.com>			12/16/2015 5:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
160						12/16/2015 5:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
161	AC_CPUC_0188849	Crider, Scott B <SCrider@sempra.com>	Lane, Bret <JLane@semprautilities.com>			4/28/2016 6:38	Email sent internally reflecting legal advice regarding company response to SS-25 leak and public relations and media inquiries about the SS-25 leak.
162	AC_CPUC_0188915	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Dragna, James J. <jim.dragna@morganlewis.com>	Lane, Bret <JLane@semprautilities.com>		7/1/2016 10:38	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
163	AC_CPUC_0188845	Lane, Bret <tpjbl@enova.com>	Crider, Scott B (SCrider@sempra.com)	Tomkins, Sharon <STomkins@semprautilities.com>; Arriola, Dennis <DArriola@semprautilities.com>		4/27/2016 8:02	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and public relations and media inquiries about the SS-25 leak.
164	AC_CPUC_0188839	Lane, Bret <tpjbl@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>			4/27/2016 6:05	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and public relations and media inquiries about the SS-25 leak.
165	AC_CPUC_0188829	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Lane, Bret <JLane@semprautilities.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 13:48	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and public relations and media inquiries about the SS-25 leak.
166		Lane, Bret <tpjbl@enova.com>	Thorp, Michael R. <MThorp@semprautilities.com>			2/25/2016 13:33	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
167		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>; Phillips, Rick <RPhillips@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
168		mansdorfer <mansdorfer@aol.com>	Lane, Bret <JLane@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
169		mansdorfer <mansdorfer@aol.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
170		mansdorfer <mansdorfer@aol.com>	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
171		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
172		Mansdorfer@aol.com	Jim.LaGrone@boots-coots.com; Lane, Bret <JLane@semprautilities.com>; Jim.Fox@driltek.com; donwshackelford@yahoo.com			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
173		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
174						2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
175		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
176		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
177		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
178		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>			2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
179		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
180		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
181		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
182		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent from counsel requesting legal advice regarding company response to SS-25 leak.
183		Mansdorfer@aol.com	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/25/2016 13:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
184		Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>			2/11/2016 13:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
185						2/11/2016 13:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
186	AC_CPUC_0165866	Van de Putte, Todd <TVandePutte@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>			2/10/2016 12:31	Email sent internally reflecting legal advice regarding company response to agency data requests.
187	AC_CPUC_0165857	Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd (TVandePutte@semprautilities.com)			2/10/2016 12:19	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
188	AC_CPUC_0170162	Lane, Bret <tpjbl@enova.com>	Don Shackelford <donwshackelford@yahoo.com>; John Wright <john.wright@bearco-intl.com>; Pete Slagel <pete@slagel.net>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Morten Haug Emilsen <morten.haug.emilsen@addenergy.no>; Arash Haghshenas <arash@boots-coots.com>; John Hatteberg <jhatteberg@boots-coots.com>	Schwecke, Rodger (RSchwecke@semprautilities.com)		2/9/2016 5:38	Email sent internally reflecting legal advice regarding company response to agency data requests.
189	AC_CPUC_0165828	Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I (JCho@semprautilities.com); Schwecke, Rodger (RSchwecke@semprautilities.com); Don Shackelford <donwshackelford@yahoo.com>	Tomkins, Sharon <STomkins@semprautilities.com>		2/8/2016 5:36	Email sent to counsel requesting legal advice regarding company response to agency data requests.
190		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd (TVandePutte@semprautilities.com)	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger (RSchwecke@semprautilities.com)		2/7/2016 13:02	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
191						2/7/2016 13:02	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
192		Lane, Bret <tpjbl@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			2/7/2016 11:11	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
193	AC_CPUC_0169802	Cho, Jimmie I <JCho@semprautilities.com>	Thorp, Michael R. <MThorp@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Tomkins, Sharon <STomkins@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Garcia, Albert J <AGarcia6@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
194		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
195						2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
196		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
197						2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
198		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
199						2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
200		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
201						2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
202		Tyler Milford <Tyler.Milford@halliburton.com>	Eddy Hinds <Eddy.Hinds@Halliburton.com>; Kevin Bautista <Kevin.Bautista@halliburton.com>; Alan Gosse <Alan.Gosse@Halliburton.com>; Kimberly Barber <Kimberly.Barber@Halliburton.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; Anthony Rizzo <Anthony.Rizzo@halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Steve Cardiff' <cardiffsr@gmail.com>; Tom Siddle <Tom.Siddle@Halliburton.com>; Tracy Holt (tracyleeholt@sbcglobal.net); Steven			2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
203						2/4/2016 10:16	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
204		Lane, Bret <tpjbl@enova.com>	Cho, Jimmie I (JCho@semprautilities.com)	Schwecke, Rodger (RSchwecke@semprautilities.com)		2/4/2016 6:03	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
205	AC_CPUC_0179682	Cho, Jimmie I <JCho@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/31/2016 18:43	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
206	AC_CPUC_0177166	Lane, Bret <tpjbl@enova.com>	Tomkins, Sharon <STomkins@semprautilities.com>; Arriola, Dennis <DArriola@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			1/17/2016 10:50	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
207	AC_CPUC_0176247	Lane, Bret <tpjbl@enova.com>	Arriola, Dennis <DArriola@semprautilities.com>; Tomkins, Sharon <STomkins@semprautilities.com>			1/13/2016 8:41	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
208	AC_CPUC_0166905	Lane, Bret <tpjbl@enova.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Don Shackelford (donwshackelford@yahoo.com)			1/11/2016 13:54	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
209	AC_CPUC_0176003	Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			1/11/2016 12:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
210		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		1/11/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
211						1/11/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
212		Lane, Bret <tpjbl@enova.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Don Shackelford (donwshackelford@yahoo.com); Arash Haghshenas <arash@boots-coots.com>			1/10/2016 16:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
213						1/10/2016 16:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
214		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Guy Fox <gfox@boots-coots.com>			3/14/2016 18:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
215		Lane, Bret <tpjbl@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Cho, Jimmie I <JCho@semprautilities.com>; Doug Derr <dderr@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Guy Fox <gfox@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		3/10/2016 6:01	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
216		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
217		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
218		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
219		JLane@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Cho, Jimmie I <JCho@semprautilities.com>; Doug Derr <dderr@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Guy Fox <gfox@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		3/10/2016 6:01	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
220		Unspecified Sender	Cho, Jimmie I (JCho@semprautilities.com)	Schwecke, Rodger (RSchwecke@semprautilities.com)		2/4/2016 6:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
221	AC_CPUC_0174454	Wagher, Ed <EWagher@semprautilities.com>	Ibay, Isaac <IIbay@semprautilities.com>			12/29/2015 21:24	Email sent internally reflecting legal advice regarding company response to agency data requests.
222	AC_CPUC_0174448	Ibay, Isaac <iibay@enova.com>	Wagher, Ed <EWagher@semprautilities.com>			12/29/2015 20:16	Email sent internally reflecting legal advice regarding company response to agency data requests.
223	AC_CPUC_0173236	Cho, Jimmie I <JCho@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		12/18/2015 13:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
224	AC_CPUC_0173439	Kerns, Barry <bkerns@enova.com>	Lane, Bret <JLane@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		12/19/2015 7:33	Email sent internally reflecting legal advice regarding company response to agency data requests.
225	AC_CPUC_0173220	Kerns, Barry <bkerns@enova.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>		12/18/2015 13:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
226	AC_CPUC_0176470	Healy, Gregory <GHealy@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			1/14/2016 11:36	Email sent internally reflecting legal advice regarding company response to agency data requests.
227	AC_CPUC_0176467	Rodriguez, Sonia <srodrig3@enova.com>	Healy, Gregory <GHealy@semprautilities.com>			1/14/2016 11:27	Email sent internally reflecting legal advice regarding company response to agency data requests.
228	AC_CPUC_0176461	Healy, Gregory <GHealy@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			1/14/2016 11:15	Email sent internally reflecting legal advice regarding company response to agency data requests.
229		Rodriguez, Sonia <srodrig3@enova.com>	Lawler, Alexandra G <AGLawler@sempra.com>; Healy, Gregory <GHealy@semprautilities.com>	'Tanenbaum, Jeffrey' <jtanenbaum@nixonpeabody.com>; Kerns, Barry <BKerns@semprautilities.com>		1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
230						1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.
231						1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
232		Rodriguez, Sonia <srodrig3@enova.com>	Navin, Neil <NNavin@semprautilities.com>; gregory.hisel@fire.lacounty.gov; Robert Salgado (rsalgado@dir.ca.gov); kcrook@arbinc.com; Mario.Tresierras@fire.lacounty.gov; McGurk, Scott@DOC <Scott.McGurk@conservation.ca.gov>; Efron, Mary Ann@DIR <MEfron@dir.ca.gov>; Kysar, Scott <SKysar@semprautilities.com>; matthewson.epuna@cpuc.ca.gov; william.mcmechen@aecom.com; Lawrence.Kathryn@epa.gov; MNazemi1@aqmd.gov; Cho, Jimmie I <JCho@semprautilities.com>; Cocker, Philip <Philip.Cocker@fire.lacounty.gov>;	scott.walker@conservation.ca.gov; kenneth.bruno@cpuc.ca.gov; Kerns, Barry <BKerns@semprautilities.com>; Mike Baggett (mbaggett@boots-coots.com); ctrombettas@dir.ca.gov; Ibay, Isaac <IIbay@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; tdraper@arbinc.com; Schwecke, Rodger <RSchwecke@semprautilities.com>		1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.
233						1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.
234						1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.
235						1/14/2016 14:29	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
236		Bill Whitney/Blade <BWhitney@blade-energy.com>	Bill Whitney/Blade <BWhitney@blade-energy.com>; Jim.LaGrone@boots-coots.com; Andrews, Larry J <LAndrews@semprautilities.com>; Nigel Alvares/Blade <NAlvares@blade-energy.com>; Randall L Rudolf/Blade <rrudolf@blade-energy.com>; Rolando.Gomez@boots-coots.com; Van de Putte, Todd <TVandePutte@semprautilities.com>; Aliso Canyon IDT ConfRoom 972-712-8400/Corporate <Aliso_Canyon_IDT_ConfRoom_972-712-8400/Corporate@mail.blade-energy.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Ravi Krishnamurthy/Blade <ravimk@blade-energy.com>		8/29/2016 11:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
237						8/29/2016 11:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
238						8/29/2016 11:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
239						8/29/2016 11:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
240		UNKNOWN	'Bill Whitney/Blade' <BWhitney@blade-energy.com>; Jim.LaGrone@boots-coots.com; LAndrews@semprautilities.com; 'Nigel Alvares/Blade' <NAlvares@blade-energy.com>; 'Randall L Rudolf/Blade' <rrudolf@blade-energy.com>; Rolando.Gomez@boots-coots.com; TVandePutte@semprautilities.com	GLaFevers@semprautilities.com; JTracy@semprautilities.com; 'Ravi Krishnamurthy/Blade' <ravimk@blade-energy.com>	'Aliso Canyon IDT Co	8/29/2016 11:01	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
241		Cardiff, Steven G <SCardiff@semprautilities.com>	Razavi, Avideh <ARazavi2@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Sera, Travis <TSera@semprautilities.com>; Monsour, Paul J. <PMonsour@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Baker, Phil E. <PBaker@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Aftab, Nadia <NAftab@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>; Garcia, Albert J <AGarcia6@semprautilities.com>		8/10/2016 16:48	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
242						8/10/2016 16:48	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
243		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Healy, Gregory <GHealy@semprautilities.com>		6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
244						6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
245	AC_CPUC_0185213	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>		6/10/2016 13:42	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
246	AC_CPUC_0185207	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>; 'Haley McIntosh' <hmmcintosh@jonesday.com>		6/10/2016 13:23	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
247		Haley McIntosh <hmmcintosh@jonesday.com>	Ng, Deana M <DNg@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>; Esterkin, Jeremy Blake <jeremy.esterkin@morganlewis.com>		8/24/2016 20:36	Email and Attachments sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak and company response to agency data requests and potential litigation.
248		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>	Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/24/2016 12:08	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
249		Haley McIntosh <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Eliasian, Maghdi <maghdi.eliasian@morganlewis.com> (maghdi.eliasian@morganlewis.com)	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 11:53	Email and Attachments sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak and company response to agency data requests and potential litigation.
250		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 11:47	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
251						8/18/2016 11:47	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
252		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Healy, Gregory <GHealy@semprautilities.com>		6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
253						6/10/2016 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
254		Rubin, Jonathan <JRubin@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Phipps, Krista L <KPhipps@semprautilities.com>		4/11/2016 13:03	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
255		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:47	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
256		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:40	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
257		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/11/2016 10:38	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
258		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:30	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
259		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:29	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
260		Hassan, Kim <KHassan@semprautilities.com>	Rubin, Jonathan <JRubin@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:15	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
261		Rubin, Jonathan <JRubin@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		4/5/2016 15:11	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
262		Rubin, Jonathan <JRubin@semprautilities.com>	Healy, Gregory <GHealy@semprautilities.com>			4/5/2016 15:06	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
263	AC_CPUC_0187704	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 21:00	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
264	AC_CPUC_0187632	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
265	AC_CPUC_0187604	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 19:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
266	AC_CPUC_0187546	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
267						9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
268	AC_CPUC_0187512	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
269	AC_CPUC_0187477	Tracy, Jill <JTracy@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:35	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
270		Rolando Gomez <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/20/2016 11:53	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
271		Jim LaGrone <Jim.LaGrone@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			9/12/2016 5:49	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
272		Rolando Gomez <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/11/2016 18:53	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
273		Tracy, Jill <JTracy@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
274						9/6/2016 10:35	Document sent internally containing attorney work product regarding company response to SS-25 leak and company response to agency data requests.
275		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
276						9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
277						9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
278						9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
279						9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
280						9/1/2016 15:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
281		Tracy, Jill <JTracy@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
282						9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
283		La Fevers, Glenn <glafever@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			8/8/2016 18:49	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
284		Jim LaGrone <Jim.LaGrone@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/8/2016 18:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
285		La Fevers, Glenn <glafever@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/8/2016 17:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
286		Rolando Gomez <Rolando.Gomez@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; DL_B&C Engineering <engineering@boots-coots.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>		7/25/2016 11:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
287						7/25/2016 11:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
288		Jim LaGrone <Jim.LaGrone@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Richard Hatteberg <rhatteberg@boots-coots.com>		7/19/2016 13:14	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
289		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		7/19/2016 11:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
290	AC_CPUC_0184740	La Fevers, Glenn <glafever@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 16:23	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
291	AC_CPUC_0184732	Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 13:45	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
292	AC_CPUC_0184726	Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>			5/26/2016 13:40	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
293	AC_CPUC_0184724	Schwecke, Rodger <RSchwecke@sempra utilities.com>	La Fevers, Glenn <GLaFevers@semprau tilities.com>; Tracy, Jill <JTracy@semprautilitie s.com>; Navin, Neil <NNavin@semprautiliti es.com>; Ng, Deana M <DNg@semprautilities. com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>			5/26/2016 13:22	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
294		Tracy, Jill <JTracy@semprautilitie s.com>	Petrizzo, Hilary E <HPetrizzo@semprautil ities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Navin, Neil <NNavin@semprautiliti es.com>; La Fevers, Glenn <GLaFevers@semprau tilities.com>; Hamze, Firas <FHamze@semprautilit ies.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; 'Rolando Gomez' <Rolando.Gomez@boo ts-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com >; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
295		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:12	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
296		Schwecke, Rodger <RSchwecke@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 9:19	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
297		Van de Putte, Todd <TVandePutte@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
298						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
299						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
300						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
301						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
302		Navin, Neil <NNavin@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/8/2016 13:47	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
303	AC_CPUC_0186107	Unspecified Sender	Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 7:01	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
304		GLaFevers@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		9/12/2016 6:10	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
305		GLaFevers@semprautilities.com	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/11/2016 19:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
306		GLaFevers@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/8/2016 17:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
307		GLaFevers@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Richard Hatteberg <rhatteberg@boots-coots.com>		7/19/2016 13:15	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
308	AC_CPUC_0184736	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 16:23	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
309		La Fevers, Glenn <glafever@enova.com>	'Rolly Gomez (rgomez@boots-coots.com)'; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'timmy.ludeman@weatherford.com'			9/23/2016 7:22	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
310						9/23/2016 7:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.
311						9/23/2016 7:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.
312						9/23/2016 7:22	Document sent internally reflecting legal advice regarding company response to SS-25 leak.
313		La Fevers, Glenn <glafever@enova.com>	'Rolly Gomez (rgomez@boots-coots.com)'; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'timmy.ludeman@weatherford.com'			9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
314						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
315						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
316						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
317						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
318						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
319						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
320						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
321						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
322						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
323						9/23/2016 7:21	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
324		La Fevers, Glenn <glafever@enova.com>	Rolly Gomez (rgomez@boots-coots.com); Jim LaGrone <Jim.LaGrone@boots-coots.com>; timmy.ludeman@weatherford.com			9/23/2016 7:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
325						9/23/2016 7:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
326						9/23/2016 7:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
327		La Fevers, Glenn <glafever@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/20/2016 12:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
328		La Fevers, Glenn <glafever@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/20/2016 10:57	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
329		La Fevers, Glenn <glafever@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>		9/12/2016 6:10	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
330		La Fevers, Glenn <glafever@enova.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/11/2016 19:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
331		La Fevers, Glenn <GLaFevers@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando.Gomez@boots-coots.com			9/11/2016 16:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
332		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
333						9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
334						9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
335		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
336						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
337						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
338						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
339		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
340						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
341						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
342						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
343		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
344						9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
345						9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
346						9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
347		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
348						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
349						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
350						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
351						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
352						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
353		Tracy, Jill <JTracy@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
354						7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
355	AC_CPUC_0188896	Tomkins, Sharon <STomkins@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			6/29/2016 18:59	Email sent from counsel providing legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
356	AC_CPUC_0184738	La Fevers, Glenn <GLaFevers@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 16:23	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
357	AC_CPUC_0188842	Lane, Bret <JLane@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			4/27/2016 6:05	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
358	AC_CPUC_0188835	Ng, Deana M <DNg@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			4/26/2016 16:33	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
359		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/25/2016 8:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
360						4/25/2016 8:48	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
361	AC_CPUC_0183950	Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/21/2016 12:48	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
362		Marsh, Jannet <JMarsh@semprautilities.com>	Levine, Randall Mark <randall.levine@morganlewis.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		7/8/2016 10:08	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
363		Schwecke, Rodger <RSchwecke@semprautilities.com>	Marsh, Jannet <JMarsh@semprautilities.com>			7/8/2016 10:08	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
364		Reichler, Laurie M. <tp2lmr@enova.com>	Baker, Phil E. <PBaker@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Martinez, Maria <MariaMartinez@semprautilities.com>; Carpenter, Bob <rcarpenter@semprautilities.com>; Sera, Travis <TSera@semprautilities.com>; Keas, Kris V <KKeas@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Romero, Victor - SCG <VRomero@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Schneider, Douglas <DSchneider@sempra	Salazar, Jeff <JLSalazar@semprautilities.com>; Aftab, Nadia <NAftab@semprautilities.com>; Madariaga, Hector <HMadariaga@semprautilities.com>; Forster, Mark A. <MAForster@semprautilities.com>; Koskie, W. Jeff <WKoskie@semprautilities.com>; TERM-04-09-16 Stanford, Ray <RStanford@semprautilities.com>; Haines, Deanna <DHaines@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Furgerson, Scott P <SFurgerson@semprautilities.com>; Egan, Jason W <JEgan@semprautilities.com>; Keawe, Geraldine <GKeawe@semprautilities.com>; Wu, Bernice K <BKWu@semprautilities.com>; Uyeda, Jean <JUyeda@semprautilities.com>; Jenkins, Lisa <LAJenkins@SempraUtilities.com>; Ayala, Frank B.		7/8/2016 10:08	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
365						7/8/2016 10:08	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
366						7/8/2016 10:08	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
367						7/8/2016 10:08	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
368	AC_CPUC_0189250	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 13:00	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
369	AC_CPUC_0189212	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 8:55	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
370	AC_CPUC_0189195	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			7/5/2016 8:34	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
371	AC_CPUC_0189185	Navin, Neil <NNavin@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 7:51	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
372	AC_CPUC_0189152	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 20:05	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
373	AC_CPUC_0189120	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 18:51	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
374						7/1/2016 18:51	Email and Attachments sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
375	AC_CPUC_0189101	Hull, Allison E <AEHull@sempra.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tomkins, Sharon <STomkins@semprauti lities.com>			7/1/2016 17:22	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
376	AC_CPUC_0189278	Schwecke, Rodger <rschwecke@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			7/5/2016 13:02	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
377	AC_CPUC_0189231	Schwecke, Rodger <rschwecke@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com> ; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com >; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 13:00	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
378	AC_CPUC_0189177	Schwecke, Rodger <rschwecke@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			7/5/2016 6:46	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
379	AC_CPUC_0189135	Schwecke, Rodger <rschwecke@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com> ; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com >; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 19:26	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.
380	AC_CPUC_0188925	Schwecke, Rodger <rschwecke@enova.com>	Tomkins, Sharon <STomkins@semprauti lities.com>; Dragna, James J. <jim.dragna@morganlewis.com>	Lane, Bret (JLane@semprautilities.com)		7/1/2016 10:38	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
381	AC_CPUC_0188869	Schwecke, Rodger <rschwecke@enova.com>	Navin, Neil <NNavin@semprautilities.com>			6/16/2016 12:37	Email sent internally reflecting legal advice regarding public relations and media inquiries about the SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
382	AC_CPUC_0184725	Schwecke, Rodger <rschwecke@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/26/2016 13:22	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
383	AC_CPUC_0170466	Schwecke, Rodger <rschwecke@enova.com>	Ng, Deana M <DNg@semprautilities.com>			5/24/2016 16:25	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
384		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email sent internally reflecting legal advice regarding company response to agency data requests.
385	AC_CPUC_0184723	RSchwecke@semprautilities.com	La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/26/2016 13:22	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
386		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com); Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/4/2016 16:19	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
387		Van de Putte, Todd <TVandePutte@sempr autilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
388						5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
389	AC_CPUC_0188832	Schwecke, Rodger <rschwecke@enova.com>	Lane, Bret (JLane@semprautilities.com)	Tomkins, Sharon <STomkins@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 13:48	Email sent to counsel requesting legal advice regarding public relations and media inquiries about the SS-25 leak.
390		Schwecke, Rodger <rschwecke@enova.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 8:04	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
391		Schwecke, Rodger <rschwecke@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 7:49	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
392		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 11:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
393		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
394						4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
395		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
396		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:09	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
397		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
398						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
399						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
400						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
401						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
402		Navin, Neil <NNavin@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/14/2016 18:06	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
403		Van de Putte, Todd <TVandePutte@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
404		Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
405		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			4/4/2016 11:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
406		Navin, Neil <NNavin@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>		3/28/2016 8:36	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
407		Doug Derr <dderr@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>			3/23/2016 14:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
408		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
409						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
410						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
411						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
412						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
413		Schwecke, Rodger <rschwecke@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 9:19	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
414		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
415		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email sent internally reflecting legal advice regarding company response to agency data requests.
416		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Dentici, Roberto <RDentici@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		9/28/2016 18:58	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
417		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:50	Email sent internally reflecting legal advice regarding company response to agency data requests.
418		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:41	Email sent internally reflecting legal advice regarding company response to agency data requests.
419		Orellana, Jennifer <JOrellana2@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			9/2/2016 10:09	Email sent internally reflecting legal advice regarding company response to agency data requests.
420		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
421						9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
422						9/1/2016 15:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
423		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
424						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
425						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
426						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
427		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
428						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
429						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
430						9/1/2016 15:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
431		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
432						9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
433						9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
434						9/1/2016 15:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
435		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>		9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
436						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
437						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
438						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
439						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
440						9/1/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
441		Rolando Gomez <Rolando.Gomez@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>			8/23/2016 11:08	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
442		Tracy, Jill <jtracy@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
443						9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
444		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/2/2016 11:05	Email sent internally reflecting legal advice regarding company response to agency data requests.
445		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:49	Email sent internally reflecting legal advice regarding company response to agency data requests.
446		Tracy, Jill <jtracy@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:40	Email sent internally reflecting legal advice regarding company response to agency data requests.
447		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		9/2/2016 9:43	Email sent internally reflecting legal advice regarding company response to agency data requests.
448		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
449						9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
450	AC_CPUC_0187618	JTracy@semprautilities.com	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
451	AC_CPUC_0187503	JTracy@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
452	AC_CPUC_0187473	Unspecified Sender	Dentici, Roberto <RDentici@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:35	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
453		Unspecified Sender	La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
454						9/6/2016 10:35	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
455		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>		9/2/2016 11:02	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
456		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:49	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
457		JTracy@semprautilities.com	Orellana, Jennifer <JOrellana2@semprautilities.com>			9/2/2016 10:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
458		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)		9/2/2016 9:43	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
459		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
460						9/1/2016 13:54	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
461		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
462						7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
463		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
464						7/22/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
465		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		7/19/2016 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
466						7/19/2016 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
467		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)		7/19/2016 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
468						7/19/2016 9:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
469	AC_CPUC_0184734	Tracy, Jill <jtracy@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 13:45	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
470	AC_CPUC_0184730	JTracy@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>		5/26/2016 13:44	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
471		Tracy, Jill <jtracy@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/26/2016 19:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
472						4/26/2016 19:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
473		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/26/2016 19:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
474						4/26/2016 19:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
475		Tracy, Jill <jtracy@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>		4/26/2016 8:31	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
476		Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>		4/26/2016 8:31	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
477	AC_CPUC_0187660	Tracy, Jill <jtracy@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email sent internally reflecting legal advice regarding gas standards.
478		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
479		Tracy, Jill <jtracy@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
480		Unspecified Sender	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
481		Chechitelli, Frank <FChechitelli@sempra utilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 10:10	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
482						4/7/2016 10:10	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
483						4/7/2016 10:10	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
484		Chechitelli, Frank <FChechitelli@sempra utilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Andy Reif <Andy.Reif@halliburton.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>		4/6/2016 13:30	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
485						4/6/2016 13:30	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
486						4/6/2016 13:30	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
487		Tracy, Jill <jtracy@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
488		JTracy@semprautilities.com	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
489		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
490		Dominick Bellotte <Dominick.Bellotte@halliburton.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; John Walters - B&C <jwalters@boots-coots.com>; Eric Bivens <Eric.Bivens@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/17/2016 20:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
491		Jim LaGrone <Jim.LaGrone@boots-coots.com>	John Walters - B&C <jwalters@boots-coots.com>; Eric Bivens <Eric.Bivens@Halliburton.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Dominick Bellotte <Dominick.Bellotte@halliburton.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		8/17/2016 17:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
492		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			8/29/2016 10:15	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
493	AC_CPUC_0184728	Van de Putte, Todd <tvandepu@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>			5/26/2016 13:40	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
494		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	La Fevers, Glenn (GLaFevers@semprautilities.com); Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
495						5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
496						5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
497						5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
498						5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
499						5/24/2016 8:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
500		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>	Richard Hatteberg <rhatteberg@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		5/16/2016 8:37	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
501		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Richard Hatteberg <rhatteberg@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		5/16/2016 8:37	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
502		Van de Putte, Todd <tvandepu@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>			5/5/2016 6:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
503		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
504						5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
505		Unspecified Sender	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
506		Van de Putte, Todd <tvandepu@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 8:02	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
507		Unspecified Sender	Schwecke, Rodger <RSchwecke@sempra utilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>		4/26/2016 7:57	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
508		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; rhatteberg@boots-coots.com; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/25/2016 8:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
509						4/25/2016 8:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
510	AC_CPUC_0183952	Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'rhatteberg@boots-coots.com'	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/21/2016 12:48	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
511	AC_CPUC_0183948	Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; rhatteberg@boots-coots.com	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		4/21/2016 12:48	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
512		Van de Putte, Todd <tvandepu@enova.com>	'rhatteberg@boots-coots.com'			4/18/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
513						4/18/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
514		Unspecified Sender	rhatteberg@boots-coots.com			4/18/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
515						4/18/2016 8:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
516		Van de Putte, Todd <tvandepu@enova.com>	'rhatteberg@boots-coots.com'			4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
517						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
518						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
519						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
520						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
521		Unspecified Sender	rhatteberg@boots-coots.com			4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
522						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
523						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
524						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
525						4/18/2016 8:45	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
526		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
527						4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
528		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
529						4/18/2016 8:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
530		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Richard Hatteberg <rhatteberg@boots-coots.com>		4/18/2016 7:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
531		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
532		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 7:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
533		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
534						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
535						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
536						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
537						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
538		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
539						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
540						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
541						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
542						4/18/2016 6:47	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
543		Van de Putte, Todd <tvandepu@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
544						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
545						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
546						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
547						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
548		Unspecified Sender	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
549						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
550						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
551						4/11/2016 14:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
552		Van de Putte, Todd <tvandepu@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
553						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
554						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
555						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
556						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
557		Unspecified Sender	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn (GLaFevers@semprautilities.com); Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
558						4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
559						4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
560						4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
561						4/11/2016 7:29	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
562						4/5/2016 17:00	Document sent internally reflecting legal advice regarding risk registry.
563						4/5/2016 17:00	Document sent internally reflecting legal advice regarding risk registry.
564		Van de Putte, Todd <tvandepu@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
565		Unspecified Sender	Kitson, Amy <AKitson@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/5/2016 13:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
566		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Rubin, Jonathan <JRubin@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/5/2016 13:30	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
567		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>		4/5/2016 13:10	Email and Attachments sent internally reflecting legal advice regarding risk registry.
568						4/5/2016 13:10	Email and Attachments sent internally reflecting legal advice regarding risk registry.
569						4/5/2016 13:10	Email and Attachments sent internally reflecting legal advice regarding risk registry.
570		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. (CBrandy@semprautilities.com)	Navin, Neil <NNavin@semprautilities.com>		4/5/2016 13:06	Email and Attachments sent internally reflecting legal advice regarding risk registry.
571						4/5/2016 13:06	Email and Attachments sent internally reflecting legal advice regarding risk registry.
572						4/5/2016 13:06	Email and Attachments sent internally reflecting legal advice regarding risk registry.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
573		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 12:51	Email and Attachments sent internally reflecting legal advice regarding risk registry.
574						4/5/2016 12:51	Email and Attachments sent internally reflecting legal advice regarding risk registry.
575						4/5/2016 12:51	Email and Attachments sent internally reflecting legal advice regarding risk registry.
576		Rubin, Jonathan <JRubin@semprautilities.com>	'jim.lagrone@boots-coots.com'; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/5/2016 11:53	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
577	AC_CPUC_0183677	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13	Email sent to internally reflecting legal advice regarding company response to SS-25 leak.
578	AC_CPUC_0183672	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13	Email sent to internally reflecting legal advice regarding company response to SS-25 leak.
579	AC_CPUC_0183652	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17	Email sent to internally reflecting legal advice regarding company response to SS-25 leak.
580	AC_CPUC_0183644	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17	Email sent to internally reflecting legal advice regarding company response to SS-25 leak.
581	AC_CPUC_0183626	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43	Email sent to internally reflecting legal advice regarding company response to SS-25 leak.
582	AC_CPUC_0183619	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43	Email sent to internally reflecting legal advice regarding company response to SS-25 leak.
583	AC_CPUC_0183613	Hesam, H. Tony <Thesam@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		4/4/2016 16:08	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
584	AC_CPUC_0183604	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
585	AC_CPUC_0183601	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
586		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
587		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>			4/4/2016 11:50	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
588		Rubin, Jonathan <JRubin@semprautilities.com>	'jim.lagrone@boots-coots.com'; Hassan, Kim <KHassan@semprautilities.com>	Talley, Kendra <KTalley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/4/2016 11:27	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
589	AC_CPUC_0183562	Hesam, H. Tony <Thesam@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 9:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and risk registry.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
590		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	William Sheridan - B&C <wsheridan@boots-coots.com>; Rosilyn Saulsberry <rsaulsberry@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>		3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding gas standards.
591						3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding gas standards.
592						3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding gas standards.
593	AC_CPUC_0187716	Dentici, Roberto <RDentici@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			10/7/2016 7:13	Email sent internally reflecting legal advice regarding company response to agency data requests.
594		Haley McIntosh <hmmcintosh@jonesday.com>	mdozier@semprautilties.com	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>		8/18/2016 14:00	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
595						8/18/2016 14:00	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
596						8/18/2016 14:00	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
597		Haley McIntosh <hmmcintosh@jonesday.com>	jim.lagrone@boots-coots.com	Van de Putte, Todd <TVandePutte@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>		8/18/2016 10:40	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
598						8/18/2016 10:40	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
599		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			5/5/2016 5:27	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
600	AC_CPUC_0183664	Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 8:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
601	AC_CPUC_0183636	Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 7:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
602		Van de Putte, Todd <tvandepu@enova.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			8/29/2016 10:15	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
603	AC_CPUC_0189402	Healy, Gregory <GHealy@semprautilities.com>	Mortazavi, Setareh <SMortazavi@semprautilities.com>; Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>			6/30/2017 15:36	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
604		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
605		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.
606		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
607		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.
608		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
609		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.
610		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
611		Tracy, Jill <jtracy@enova.com>	'Levine, Randall Mark' <randall.levine@morganlewis.com>			4/25/2016 12:02	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
612		Tracy, Jill <jtracy@enova.com>	Levine, Randall Mark <randall.levine@morganlewis.com>			4/25/2016 12:02	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
613		Tracy, Jill <jtracy@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautiliti es.com>; La Fevers, Glenn <GLaFevers@semprau tilities.com>; Ali Reza <reza@exponent.com> ; Ng, Deana M <DNg@semprautilities. com>; Orellana, Jennifer <JOrellana2@semprau tilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
614		Tracy, Jill <jtracy@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; jim.lagrone@boots-coots.com; Navin, Neil <NNavin@semprautiliti es.com>; La Fevers, Glenn <GLaFevers@semprau tilities.com>; Ali Reza <reza@exponent.com> ; Ng, Deana M <DNg@semprautilities. com>; Orellana, Jennifer (JOrellana2@semprautilities.com)			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
615		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>; Levine, Randall Mark <randall.levine@morganlewis.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
616		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; jim.lagrone@boots-coots.com; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
617		Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; jim.lagrone@boots-coots.com; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer (JOrellana2@semprautilities.com)			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
618		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>; Levine, Randall Mark <randall.levine@morganlewis.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
619		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com';	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
620	AC_CPUC_0178348	Alexander, Lisa <lalexand@enova.com>	Sim, Michelle M <MSim@semprautilities.com>	Kristjansson, Sue <SKristjansson@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		1/26/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
621						1/26/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
622						1/26/2016 8:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
623		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
624		Cho, Jimmie I <jicho@enova.com>	Cho, Jimmie I <JCho@semprautilities.com>	'Alan Gosse'; Kevin Bautista; La Fevers, Glenn; tracyleeholt@sbcglobal.net; John Hatteberg; 'Wayne Courville'; Rolando Gomez; Jim LaGrone		4/7/2016 15:38	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
625		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com';	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
626		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
627		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com';	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
628		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Alan.Gosse@Halliburton.com; Kevin.Bautista@hallibrton.com; Kimberly.Barber@Halliburton.com; John Hatteberg <jhatteberg@boots-coots.com>; Wayne.Courville@boots-coots.com	De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Steve Cardiff <cardiffsr@gmail.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		12/18/2015 16:09	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
629						12/18/2015 16:09	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
630		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
631		Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
632		Shapiro, Daniel <DShapiro@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com'; Joshua Bernard <jobernard@henkels.com>; John (Civil H&M)	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
633		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com';	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
634	AC_CPUC_0187797	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		10/11/2016 8:54	Email sent internally reflecting legal advice regarding company response to agency data requests.
635	AC_CPUC_0187681	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			10/6/2016 20:43	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
636	AC_CPUC_0187646	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 19:42	Email sent internally reflecting legal advice regarding company response to agency data requests.
637	AC_CPUC_0187614	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 19:07	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
638	AC_CPUC_0187550	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
639						9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
640	AC_CPUC_0187516	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email sent internally reflecting legal advice regarding company response to agency data requests.
641	AC_CPUC_0187485	Tracy, Jill <JTracy@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:35	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
642	AC_CPUC_0187459	Dentici, Roberto <719373e031c64d8596e05b6c846ac744-dentici, roberto@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/29/2016 15:31	Email sent internally reflecting legal advice regarding company response to agency data requests.
643	AC_CPUC_0187371	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
644						9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
645	AC_CPUC_0187359	Tracy, Jill <JTracy@sempra utilities.com>	Navin, Neil <NNavin@sempra utilities.com>; Dentici, Roberto <RDentici@sempra utilities.com>; Van de Putte, Todd <TVandePutte@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Petrizzo, Hilary E <HPetrizzo@sempra utilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@sempra utilities.com>; Andrews, Larry J <LAndrews@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>		9/26/2016 15:14	Email sent internally reflecting legal advice regarding company response to agency data requests.
646	AC_CPUC_0189390	Neville, Dan <DNeville@sempra utilities.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Dentici, Roberto <RDentici@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>			12/21/2016 14:25	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
647		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
648		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
649						3/14/2016 12:01	Document sent internally reflecting legal advice regarding risk registry.
650						3/14/2016 12:01	Document sent internally reflecting legal advice regarding risk registry.
651		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
652		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
653	AC_CPUC_0188866	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			6/16/2016 12:37	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
654		Navin, Neil <nnavin@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>	James LaGrone (jim.lagrone@boots-coots.com)		4/27/2016 12:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
655						4/27/2016 12:40	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
656		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
657		Navin, Neil <nnavin@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/14/2016 18:06	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
658						4/14/2016 18:06	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
659		Unspecified Sender	Rolando Gomez <Rolando.Gomez@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; James LaGrone (jim.lagrone@boots-coots.com)		4/8/2016 13:39	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
660	AC_CPUC_0183668	Navin, Neil <nnavin@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 8:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
661	AC_CPUC_0183660	NNavin@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 8:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
662	AC_CPUC_0183640	Navin, Neil <nnavin@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 7:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
663	AC_CPUC_0183632	NNavin@semprautilities.com	Van de Putte, Todd <TVandePutte@semprautilities.com>			4/5/2016 7:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
664		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>		3/28/2016 8:36	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
665		Unspecified Sender	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/28/2016 8:27	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
666		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>		3/28/2016 8:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
667						3/28/2016 8:13	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
668		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@sempra utilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/24/2016 6:29	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
669		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@sempra utilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
670		Unspecified Sender	Navin, Neil <NNavin@sempra utilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@sempra utilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:48	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
671		Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/23/2016 21:38	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
672		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Guy Fox <gfox@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 13:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
673		Navin, Neil <nnavin@enova.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 10:39	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
674		Navin, Neil <nnavin@enova.com>	Carl Cramm <Carl.Cramm@boots-coots.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 10:23	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
675		Unspecified Sender	Carl Cramm <Carl.Cramm@boots-coots.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 9:45	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
676		Navin, Neil <nnavin@enova.com>	Carl Cramm <Carl.Cramm@boots-coots.com>			3/18/2016 13:52	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
677		Navin, Neil <nnavin@enova.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		3/16/2016 13:53	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
678		Navin, Neil <nnavin@enova.com>	Jim.LaGrone@boots-coots.com	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		3/16/2016 9:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
679						3/16/2016 9:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
680						3/16/2016 9:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
681		Unspecified Sender	Jim.LaGrone@boots-coots.com	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		3/16/2016 9:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
682						3/16/2016 9:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
683						3/16/2016 9:34	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
684		Navin, Neil <nnavin@enova.com>	William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/15/2016 13:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
685		Mail Delivery Subsystem <MAILER-DAEMON@ms-smtp-p01.sempra.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
686		Navin, Neil <NNavin@semprautilities.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 13:42	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
687		Navin, Neil <nnavin@enova.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 13:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
688		Mail Delivery Subsystem <MAILER-DAEMON@ms-smtp-p01.sempra.com>	bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 7:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
689		Navin, Neil <NNavin@semprautilities.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 7:44	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
690		Navin, Neil <nnavin@enova.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/15/2016 7:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
691		Navin, Neil <nnavin@enova.com>	Guy Fox <gfox@boots-coots.com>			3/15/2016 7:39	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
692		Navin, Neil <nnavin@enova.com>	Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
693		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>	Michael Noel <Mike.Noel@Halliburton.com>; Sera, Travis <TSera@semprautilities.com>		3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
694		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
695		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
696		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
697		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
698		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@sempra utilities.com>; Lane, Bret <JLane@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempra utilities.com>; McMahon, Thomas D. <TMcMahon@sempra utilities.com>; Razavi, Avideh <ARazavi2@sempra utilities.com>; Neville, Dan <DNeville@sempra utilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
699		Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:05	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
700	AC_CPUC_0183357	Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 8:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
701		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 8:20	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
702		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 4:49	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
703		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 4:35	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
704	AC_CPUC_0183681	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 9:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
705	AC_CPUC_0183648	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 8:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
706	AC_CPUC_0183623	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			4/5/2016 6:43	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
707	AC_CPUC_0183607	Van de Putte, Todd <TVandePutte@sempr autilities.com>	Navin, Neil <NNavin@semprautiliti es.com>; Hesam, H. Tony <Thesam@semprautiliti es.com>; Chechitelli, Frank <FChechitelli@sempra utilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilitie s.com>; Hobbs, Rick <RHobbs@semprautilities.com> ; Langan, Ken <KLangan@semprautilities.com >; Sanders, Cole B <CSanders2@semprautilities.co m>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
708		Doug Derr <dderr@boots-coots.com>	Navin, Neil <NNavin@semprautiliti es.com>			3/22/2016 10:48	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
709		Leonardo Portillo <lportillo@boots-coots.com>	Navin, Neil <NNavin@semprautiliti es.com>			3/21/2016 12:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
710		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautiliti es.com>			3/21/2016 14:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
711		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautiliti es.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@semprautilitie s.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@semprautilit ies.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
712		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>		3/21/2016 10:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
713						3/21/2016 10:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
714	AC_CPUC_0177208	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			1/17/2016 16:24	Email and Attachments sent internally reflecting legal advice and containing attorney work product regarding company response to SS-25 leak.
715	AC_CPUC_0187375	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy,Jill; Navin,Neil; Dentici,Roberto; Van de Putte,Todd; McMahon,Thomas D.; Jim.LaGrone@boots-coots.com; Rolly Gomez; Hamze,Firas; Andrews,Larry J	Schwecke,Rodger; La Fevers,Glenn		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
716						9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
717		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>		7/19/2016 11:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
718		Schwecke, Rodger <RSchwecke@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautil ities.com>; 'Rolando Gomez' <Rolando.Gomez@boo ts-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.co m>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 9:19	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
719		Petrizzo, Hilary E <HPetrizzo@semprautil ities.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>; 'Rolando Gomez' <Rolando.Gomez@boo ts-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.c om>; La Fevers, Glenn <GLaFevers@semprautilities.co m>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
720		Van de Putte, Todd <TVandePutte@sempr autilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautil ities.com>; 'Rolando Gomez' <Rolando.Gomez@boo ts-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.c om>; La Fevers, Glenn <GLaFevers@semprautilities.co m>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
721						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
722						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
723						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
724						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
725						4/11/2016 7:31	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
726	AC_CPUC_0183685	Van de Putte, Todd <TVandePutte@sempr autilities.com>	Navin, Neil <NNavin@semprautiliti es.com>			4/5/2016 9:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
727	AC_CPUC_0183656	Van de Putte, Todd <TVandePutte@sempr autilities.com>	Navin, Neil <NNavin@semprautiliti es.com>			4/5/2016 8:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
728	AC_CPUC_0183629	Van de Putte, Todd <TVandePutte@sempr autilities.com>	Navin, Neil <NNavin@semprautiliti es.com>			4/5/2016 6:43	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
729	AC_CPUC_0183616	Hesam, H. Tony <Thesam@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>		4/4/2016 16:08	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
730	AC_CPUC_0183610	Van de Putte, Todd <TVandePutte@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 15:31	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
731	AC_CPUC_0183580	Hesam, H. Tony <Thesam@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 9:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
732						4/4/2016 7:50	Document sent internally reflecting legal advice regarding risk registry.
733		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
734						3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
735		Tracy, Jill <JTracy@sempra utilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Navin, Neil <NNavin@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@sempra utilities.com>		3/24/2016 9:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
736		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@sempra utilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; deby@blowoutengineers.com; David Vaught <David.Vaught@halliburton.com>; Mark Brake <Mark.Brake@Halliburton.com>; jlarrison@blowoutengineers.com; Jim LaGrone <Jim.LaGrone@boots-coots.com>		3/24/2016 9:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
737		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@sempra utilities.com>; Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@sempra utilities.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Hamze, Firas <FHamze@sempra utilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/24/2016 4:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
738		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Rodger Schwecke <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
739						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
740						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
741						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
742						3/23/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
743		Doug Derr <dderr@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/22/2016 3:48	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
744		Leonardo Portillo <lportillo@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/21/2016 5:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
745		Carl Cramm <Carl.Cramm@boots-coots.com>	NNavin@semprautilities.com	Guy Fox <gfox@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Doug Derr <dderr@boots-coots.com>; Keith Romaine <Keith.Romaine@halliburton.com>; Leonardo Portillo <lportillo@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>		3/18/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
746						3/18/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
747						3/18/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
748						3/18/2016 13:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
749		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/21/2016 7:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
750	AC_CPUC_0183373	Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 11:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
751	AC_CPUC_0183359	Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 8:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
752		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 8:20	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
753		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>			3/15/2016 4:49	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
754		Orellana, Jennifer <jorella2@enova.com>	Orellana,Jennifer <JOrellana2@semprautilities.com>; Schwecke,Rodger <RSchwecke@semprautilities.com>; Tracy,Jill <JTracy@semprautilities.com>; Navin,Neil <NNavin@semprautilities.com>; La Fevers,Glenn <GLaFevers@semprautilities.com>; Van de Putte,Todd <TVandePutte@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>			9/2/2016 3:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
755		Navin, Neil <nnavin@enova.com>	Navin,Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke,Rodger <RSchwecke@semprautilities.com>; Tracy,Jill <JTracy@semprautilities.com>; La Fevers,Glenn <GLaFevers@semprautilities.com>; Hamze,Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 14:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
756						3/21/2016 3:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
757						3/21/2016 3:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
758		Navin, Neil <nnavin@enova.com>	Petrizzo,Hilary E	Barr,Brian A		7/6/2016 11:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
759						7/6/2016 11:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
760	AC_CPUC_0188900	Navin, Neil <nnavin@enova.com>	Barr,Brian A <BBarr@semprautilities.com>; Kitson,Amy <AKitson@semprautilities.com>; Moore,Cathy S. <cmoore@semprautilities.com>	Howell,Robert <RHowell@semprautilities.com>		7/1/2016 9:09	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
761	AC_CPUC_0187790	Unspecified Sender	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		10/11/2016 8:53	Email sent internally reflecting legal advice regarding company response to agency data requests.
762	AC_CPUC_0187727	Unspecified Sender	Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			10/7/2016 7:25	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
763	AC_CPUC_0187687	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 20:46	Email sent internally reflecting legal advice regarding company response to agency data requests.
764	AC_CPUC_0187674	Unspecified Sender	Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			10/6/2016 20:43	Email sent internally reflecting legal advice regarding company response to agency data requests.
765	AC_CPUC_0187591	Unspecified Sender	Van de Putte, Todd <TVandePutte@semprautilities.com>			9/30/2016 15:29	Email sent internally reflecting legal advice regarding company response to agency data requests.
766	AC_CPUC_0187578	Van de Putte, Todd <TVandePutte@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			9/30/2016 15:29	Email sent internally reflecting legal advice regarding company response to agency data requests.
767	AC_CPUC_0187565	Unspecified Sender	Van de Putte, Todd <TVandePutte@semprautilities.com>			9/30/2016 15:28	Email sent internally reflecting legal advice regarding company response to agency data requests.
768	AC_CPUC_0187557	Van de Putte, Todd <TVandePutte@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			9/30/2016 15:27	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
769	AC_CPUC_0187543	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
770						9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
771	AC_CPUC_0187519	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email sent internally reflecting legal advice regarding company response to agency data requests.
772	AC_CPUC_0187365	Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
773						9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
774	AC_CPUC_0186547	Unspecified Sender	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
775						9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
776	AC_CPUC_0189241	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 13:00	Email sent internally reflecting legal advice regarding company response to agency data requests.
777	AC_CPUC_0189203	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 8:55	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
778	AC_CPUC_0189144	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 20:04	Email sent internally reflecting legal advice regarding company response to agency data requests.
779	AC_CPUC_0189113	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 18:51	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
780						7/1/2016 18:51	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
781	AC_CPUC_0189106	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>		7/1/2016 17:25	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
782						7/1/2016 17:25	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
783	AC_CPUC_0189063	Unspecified Sender	Barr, Brian A <BBarr@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>	Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 14:48	Email sent internally reflecting legal advice regarding company response to agency data requests.
784	AC_CPUC_0189049	Unspecified Sender	Barr, Brian A <BBarr@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>	Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/1/2016 14:36	Email sent internally reflecting legal advice regarding company response to agency data requests.
785	AC_CPUC_0189031	Unspecified Sender	Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Canedo, Fiorella L <FCanedo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		7/1/2016 14:24	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
786						7/1/2016 14:24	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
787	AC_CPUC_0189015	Kitson, Amy <AKitson@semprautilities.com>	Moore, Cathy S. <cmoore@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Canedo, Fiorella L <FCanedo@semprautilities.com>		7/1/2016 13:52	Email sent internally reflecting legal advice regarding company response to agency data requests.
788	AC_CPUC_0189001	Unspecified Sender	Moore, Cathy S. <cmoore@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Canedo, Fiorella L <FCanedo@semprautilities.com>		7/1/2016 13:50	Email sent internally reflecting legal advice regarding company response to agency data requests.
789	AC_CPUC_0188994	Moore, Cathy S. <cmoore@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Canedo, Fiorella L <FCanedo@semprautilities.com>		7/1/2016 13:49	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
790	AC_CPUC_0185258	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>			6/13/2016 7:44	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
791	AC_CPUC_0185255	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>			6/13/2016 7:44	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
792		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/13/2016 7:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
793						6/13/2016 7:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
794		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>		6/13/2016 7:05	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
795						6/13/2016 7:05	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
796		Unspecified Sender	Wayne Courville <Wayne.Courville@boots-coots.com>	Haley McIntosh <hmmcintosh@jonesday.com>		6/13/2016 7:05	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
797						6/13/2016 7:05	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
798	AC_CPUC_0185237	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:33	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
799	AC_CPUC_0185235	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:32	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
800	AC_CPUC_0185231	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 15:18	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
801	AC_CPUC_0185227	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 15:18	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
802	AC_CPUC_0185210	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Healy, Gregory <GHealy@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>; 'Haley McIntosh' <hmmcintosh@jonesday.com>		6/10/2016 13:23	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
803	AC_CPUC_0185204	Unspecified Sender	Healy, Gregory <GHealy@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>; Haley McIntosh <hmmcintosh@jonesday.com>		6/10/2016 13:23	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
804	AC_CPUC_0170537	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 12:58	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
805	AC_CPUC_0170534	Unspecified Sender	Haley McIntosh <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 12:58	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
806	AC_CPUC_0170521	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 8:04	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
807	AC_CPUC_0170519	Unspecified Sender	Cardiff, Steven G <SCardiff@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 8:04	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
808	AC_CPUC_0170515	Cardiff, Steven G <SCardiff@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 18:02	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
809	AC_CPUC_0185172	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:58	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
810	AC_CPUC_0185148	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:55	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
811	AC_CPUC_0170486	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:50	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
812	AC_CPUC_0170482	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:50	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
813	AC_CPUC_0189269	Schwecke, Rodger <RSchwecke@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			7/5/2016 13:02	Email sent internally reflecting legal advice regarding company response to agency data requests.
814	AC_CPUC_0189169	Schwecke, Rodger <RSchwecke@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			7/5/2016 6:46	Email sent internally reflecting legal advice regarding company response to agency data requests.
815	AC_CPUC_0189023	Kitson, Amy <AKitson@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			7/1/2016 13:53	Email sent internally reflecting legal advice regarding company response to agency data requests.
816	AC_CPUC_0188989	Navin, Neil <NNavin@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			7/1/2016 13:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
817						7/1/2016 13:27	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
818	AC_CPUC_0188983	Navin, Neil <NNavin@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Howell, Robert <RHowell@semprautilities.com>		7/1/2016 13:01	Email sent internally reflecting legal advice regarding company response to agency data requests.
819	AC_CPUC_0185261	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/13/2016 10:11	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
820	AC_CPUC_0185239	Haley McIntosh <hmmcintosh@jonesday.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>		6/10/2016 15:52	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
821	AC_CPUC_0170531	Haley McIntosh <hmmcintosh@jonesday.com>	Frescas, Arturo <AFrescas@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 11:56	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
822	AC_CPUC_0170529	Frescas, Arturo <AFrescas@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Cardiff, Steven G <SCardiff@semprautilities.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>		6/10/2016 10:50	Email sent from counsel providing legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
823	AC_CPUC_0170525	Cardiff, Steven G <SCardiff@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 9:13	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
824	AC_CPUC_0170510	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 17:11	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
825	AC_CPUC_0187801	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		10/11/2016 8:54	Email sent internally reflecting legal advice regarding company response to agency data requests.
826	AC_CPUC_0187730	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			10/7/2016 7:25	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
827	AC_CPUC_0187697	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 20:46	Email sent internally reflecting legal advice regarding company response to agency data requests.
828	AC_CPUC_0187684	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			10/6/2016 20:43	Email sent internally reflecting legal advice regarding company response to agency data requests.
829	AC_CPUC_0187595	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			9/30/2016 15:29	Email sent internally reflecting legal advice regarding company response to agency data requests.
830	AC_CPUC_0187574	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			9/30/2016 15:28	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
831	AC_CPUC_0187553	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
832						9/30/2016 15:23	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
833	AC_CPUC_0187522	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 8:02	Email sent internally reflecting legal advice regarding company response to agency data requests.
834	AC_CPUC_0187373	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
835						9/27/2016 16:04	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
836	AC_CPUC_0186659	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
837						9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
838	AC_CPUC_0189260	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 13:00	Email sent internally reflecting legal advice regarding company response to agency data requests.
839	AC_CPUC_0189222	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com>; van der Leeden, Ronald <RvanderLeeden@semprautilities.com>		7/5/2016 8:55	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
840	AC_CPUC_0189161	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com> ; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com >; van der Leeden, Ronald <RvanderLeeden@semprautiliti es.com>		7/1/2016 20:05	Email sent internally reflecting legal advice regarding company response to agency data requests.
841	AC_CPUC_0189128	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Navin, Neil <NNavin@semprautilities.com>; Barr, Brian A <BBarr@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com> ; Moore, Cathy S. <cmoore@semprautilities.com>; Howell, Robert <RHowell@semprautilities.com >; van der Leeden, Ronald <RvanderLeeden@semprautiliti es.com>		7/1/2016 18:51	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
842						7/1/2016 18:51	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
843	AC_CPUC_0189070	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Barr, Brian A <BBarr@semprautilities .com>; Navin, Neil <NNavin@semprautiliti es.com>; Kitson, Amy <AKitson@semprautiliti es.com>; Moore, Cathy S. <cmoore@semprautiliti es.com>	Howell, Robert <RHowell@semprautilities.com >; van der Leeden, Ronald <RvanderLeeden@semprautiliti es.com>		7/1/2016 14:48	Email sent internally reflecting legal advice regarding company response to agency data requests.
844	AC_CPUC_0189056	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Barr, Brian A <BBarr@semprautilities .com>; Navin, Neil <NNavin@semprautiliti es.com>; Kitson, Amy <AKitson@semprautiliti es.com>; Moore, Cathy S. <cmoore@semprautiliti es.com>	Howell, Robert <RHowell@semprautilities.com >; van der Leeden, Ronald <RvanderLeeden@semprautiliti es.com>		7/1/2016 14:36	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
845	AC_CPUC_0189040	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Moore, Cathy S. <cmoore@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Canedo, Fiorella L <FCanedo@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		7/1/2016 14:35	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
846						7/1/2016 14:35	Email and Attachments sent internally reflecting legal advice regarding company response to agency data requests.
847	AC_CPUC_0189008	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Moore, Cathy S. <cmoore@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Barr, Brian A <BBarr@semprautilities.com>; Canedo, Fiorella L <FCanedo@semprautilities.com>		7/1/2016 13:50	Email sent internally reflecting legal advice regarding company response to agency data requests.
848		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/26/2016 14:46	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
849		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com> - on behalf of - Shapiro, Daniel <dshapiro@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/15/2016 8:28	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
850		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59	Email sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak and potential litigation.
851		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
852		Unspecified Sender	Hassan, Kim <KHassan@semprautilities.com>; Arash Haghshenas <arash@boots-coots.com>			4/14/2016 13:31	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
853		Unspecified Sender	'Arash Haghshenas' <arash@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
854						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
855						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
856						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
857						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
858						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
859						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
860						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
861						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
862						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
863						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
864						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
865						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
866						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
867						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
868		Unspecified Sender	Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 8:18	Email sent internally reflecting legal advice regarding company response to agency data requests.
869		Unspecified Sender	Gates, Beth A. <BAGates@semprautilities.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/11/2016 7:21	Email sent internally reflecting legal advice regarding company response to agency data requests.
870		Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Hassan, Kim <KHassan@semprautilities.com>		4/19/2016 9:09	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and potential litigation.
871		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 14:05	Email sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak and potential litigation.
872		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:58	Email sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak.
873		Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:50	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
874		Hassan, Kim <KHassan@semprautilities.com>	Arash Haghshenas <arash@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		4/14/2016 13:25	Email sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak.
875		Arash Haghshenas <arash@boots-coots.com>	Hassan, Kim <KHassan@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			4/14/2016 13:14	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
876		Hassan, Kim <KHassan@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Arash Haghshenas <arash@boots-coots.com>		4/14/2016 12:57	Email sent from counsel providing legal advice and containing attorney work product regarding company response to SS-25 leak.
877		Gates, Beth A. <BAGates@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/11/2016 7:39	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
878		Lane, Bret <JLane@semprautilities.com>	John Wright <john.wright@bearco-intl.com>; Pete Slagel <pete@slagel.net>; Morten Haug Emilsen <morten.haug.emilsen@addenergy.no>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Arash Haghshenas <arash@boots-coots.com>; John Hatteberg <jhatteberg@boots-coots.com>; Wayne Courville <Wayne.Courville@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautil	Don Shackelford <donwshackelford@yahoo.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		2/9/2016 15:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
879						2/9/2016 15:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
880		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			2/6/2016 16:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
881	AC_CPUC_0171202	Howes, Marlin E. <MHowes@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
882						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
883						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
884						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
885						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
886						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
887						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
888						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
889						11/21/2015 10:02	Email and Attachments sent from counsel providing legal advice regarding company response to SS-25 leak.
890		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com> - on behalf of - Shapiro, Daniel <dshapiro@enova.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/15/2016 8:28	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
891		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:59	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
892		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 13:57	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
893		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Hassan, Kim <KHassan@semprautilities.com>; Arash Haghshenas <arash@boots-coots.com>			4/14/2016 13:31	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
894		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Arash Haghshenas' <arash@boots-coots.com>; Hassan, Kim <KHassan@semprautilities.com>			4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
895						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
896						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
897						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
898						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
899						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
900						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
901						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
902						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
903						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
904						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
905						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
906						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
907						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
908						4/14/2016 12:54	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
909		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		4/11/2016 7:32	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
910		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Gates, Beth A. <BAGates@semprautilities.com>	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/11/2016 7:21	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
911	AC_CPUC_0173657	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:57	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
912	AC_CPUC_0173646	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	John Hatteberg <jhatteberg@boots-coots.com>	Lane, Bret <JLane@semprautilities.com>		12/21/2015 9:12	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
913	AC_CPUC_0171205	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 11:12	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
914	AC_CPUC_0171186	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 8:43	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
915	AC_CPUC_0171195	Unspecified Sender	Howes, Marlin E. <MHowes@semprautilities.com>			11/21/2015 8:46	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
916	AC_CPUC_0165706	Kundly, Christine M <CKundly@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			12/15/2015 14:06	Email sent internally reflecting legal advice regarding company response to agency data requests.
917	AC_CPUC_0172481	Healy, Gregory <GHealy@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>			12/10/2015 10:27	Email sent internally reflecting legal advice regarding company response to agency data requests.
918		Snyder, Hal <hsnyder@enova.com>	Lane, Bret <JLane@semprautilities.com>	Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		1/3/2016 8:58	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
919		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas			1/30/2016 17:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
920		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas			1/30/2016 17:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
921		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			12/28/2015 14:50	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
922		Wayne Courville <Wayne.Courville@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			12/11/2015 12:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
923		Lane, Bret <JLane@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>; Sylvia Estrada <Sylvia.Estrada@halliburton.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Leonardo Portillo <lportillo@boots-coots.com>; Monica Williamson <Monica.Williamson@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/9/2015 5:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
924		Lane, Bret <JLane@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>; Sylvia Estrada <Sylvia.Estrada@halliburton.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; Leonardo Portillo <lportillo@boots-coots.com>; Monica Williamson <Monica.Williamson@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>		12/7/2015 11:18	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
925		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/28/2015 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
926		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/28/2015 14:30	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
927		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/11/2015 12:45	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
928		Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	John Hatteberg <jhatteberg@boots-coots.com>			12/11/2015 9:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
929						12/11/2015 9:43	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
930		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Wayne Courville' <Wayne.Courville@boots-coots.com>			12/11/2015 7:38	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
931		Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'John Hatteberg' <jhatteberg@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>		12/4/2015 9:27	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
932		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas			1/30/2016 17:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
933		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Rick Gentges <rgentges@rcp.com>; Elaine Froneberger <EFroneberger@rcp.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>		3/13/2017 9:08	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
934						3/13/2017 9:08	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
935		Guy Fox <gfox@boots-coots.com>	Navin, Neil (NNavin@semprautilities.com); tvandeputte@semprautilities.com	William Sheridan - B&C <wsheridan@boots-coots.com>; Rosilyn Saulsberry <rsaulsberry@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>		3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
936						3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
937						3/31/2016 4:55	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
938	AC_CPUC_0185686	Salter, Paul <paul.salter@aecom.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			8/10/2016 16:05	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
939	AC_CPUC_0185682	HPetrizzo@semprautilities.com	Salter, Paul <paul.salter@aecom.com>			8/10/2016 15:18	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
940	AC_CPUC_0185678	Unspecified Sender	Salter, Paul <paul.salter@aecom.com>			8/10/2016 10:19	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
941	AC_CPUC_0185676	Salter, Paul <paul.salter@aecom.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			8/10/2016 10:19	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
942	AC_CPUC_0185672	Unspecified Sender	Salter, Paul <paul.salter@aecom.com>			8/10/2016 10:14	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
943	AC_CPUC_0185670	Salter, Paul <paul.salter@aecom.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			8/10/2016 10:10	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
944	AC_CPUC_0185684	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Salter, Paul <paul.salter@aecom.com>			8/10/2016 15:18	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
945	AC_CPUC_0185680	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Salter, Paul' <paul.salter@aecom.com>			8/10/2016 10:20	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
946	AC_CPUC_0185674	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	'Salter, Paul' <paul.salter@aecom.com>			8/10/2016 10:14	Email sent internally reflecting legal advice regarding company response to the SS25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
947	AC_CPUC_0189415	Healy, Gregory <GHealy@semprautilities.com>	Eliasian, Maghdi <maghdi.eliasian@morganlewis.com>; Mortazavi, Setareh <SMortazavi@semprautilities.com>			8/17/2017 12:06	Email sent to counsel requesting legal advice regarding company response to agency data requests.
948	AC_CPUC_0170540	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	'Haley McIntosh' <hmmcintosh@jonesday.com>; Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/10/2016 12:58	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
949	AC_CPUC_0170527	Cardiff, Steven G <sgcardif@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 9:13	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
950	AC_CPUC_0170523	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>; Frescas, Arturo <AFrescas@semprautilities.com>			6/10/2016 8:04	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
951	AC_CPUC_0170517	Cardiff, Steven G <sgcardif@enova.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 18:02	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
952	AC_CPUC_0170513	Unspecified Sender	Frescas, Arturo <AFrescas@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			6/9/2016 18:00	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
953	AC_CPUC_0170488	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>; Hassan, Kim <KHassan@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:58	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
954						6/9/2016 6:58	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
955						6/9/2016 6:58	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
956	AC_CPUC_0170484	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Frescas, Arturo <AFrescas@semprautilities.com>	Cardiff, Steven G <SCardiff@semprautilities.com>		6/9/2016 6:50	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
957	AC_CPUC_0187712	Tracy, Jill <JTracy@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		10/6/2016 21:00	Email sent internally reflecting legal advice regarding company response to agency data requests.
958	AC_CPUC_0187462	Dentici, Roberto <RDentici@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/29/2016 15:31	Email sent internally reflecting legal advice regarding company response to agency data requests.
959		Hamze, Firas <tpfhh@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			9/12/2016 14:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
960		La Fevers, Glenn <GLaFevers@semprautilities.com>	Hamze, Firas <FHamze@semprautilities.com>			9/12/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
961	AC_CPUC_0186661	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
962						9/12/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
963	AC_CPUC_0186327	La Fevers, Glenn <GLaFevers@semprautilities.com>	Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)			9/12/2016 7:01	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
964		La Fevers, Glenn <GLaFevers@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolly Gomez (rgomez@boots-coots.com)	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>		9/12/2016 6:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
965						9/12/2016 6:57	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
966		Tracy, Jill <JTracy@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>			7/22/2016 11:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
967						7/22/2016 11:02	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
968		Hamze, Firas <tpfhh@enova.com>	'Fernandez, Darrell' <Darrell.Fernandez@consultant.aecom.com>; 'rgomez@boots-coots.com'			7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
969						7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
970		Hamze, Firas <tpfhh@enova.com>	'Fernandez, Darrell' <Darrell.Fernandez@consultant.aecom.com>; 'rgomez@boots-coots.com'			7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
971						7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
972		La Fevers, Glenn <GLaFevers@semprautilities.com>	Hamze, Firas <FHamze@semprautilities.com>			9/12/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
973						9/12/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
974		Unspecified Sender	'Fernandez, Darrell' <Darrell.Fernandez@consultant.aecom.com>; rgomez@boots-coots.com			7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
975						7/6/2016 21:26	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
976		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>; 'Blake, Thomas FCL' <TBlake@fugro.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; DL_B&C Engineering <engineering@boots-coots.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>; Bo Burris <bburris@boots-coots.com>		5/6/2016 10:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
977						5/6/2016 10:18	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
978		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com); Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/4/2016 16:19	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
979		Van de Putte, Todd <TVandePutte@sempr autilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>; Larry Lorenz (Larry.Lorenz@ensignenergy.com)	Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
980						5/3/2016 14:16	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
981		Navin, Neil <NNavin@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>	Doug Derr <dderr@boots-coots.com>; Carl Cramm <Carl.Cramm@boots-coots.com>; Andy Cuthbert <Andy.Cuthbert@Halliburton.com>; Guy Fox <gfox@boots-coots.com>; William Sheridan - B&C <wsheridan@boots-coots.com>; Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>		3/28/2016 8:36	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
982		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
983						3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
984						3/24/2016 10:59	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
985		Tracy, Jill <JTracy@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>		3/24/2016 9:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
986		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>; deby@blowoutengineers.com; David Vaught <David.Vaught@halliburton.com>; Mark Brake <Mark.Brake@Halliburton.com>; jlarrison@blowoutengineers.com; Jim LaGrone <Jim.LaGrone@boots-coots.com>		3/24/2016 9:16	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
987		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/24/2016 4:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
988		FHamze@semprautilities.com	Shapiro, Daniel <DShapiro@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>		4/18/2016 7:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
989		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com';	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
990		Shapiro, Daniel <dshapiro@enova.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Presley, Jason <JPresley@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; 'TBlake@fugro.com';	'Rolando Gomez' <Rolando.Gomez@boots-coots.com>		4/15/2016 14:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
991		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>	Carl Cramm <Carl.Cramm@boots-coots.com>		3/23/2016 21:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
992	AC_CPUC_0170476	Schwecke, Rodger <RSchwecke@semprautilities.com>	Razavi, Avideh <ARazavi2@semprautilities.com>			5/27/2016 19:28	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
993		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.
994		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
995		Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>; jim.lagrone@boots-coots.com; gfox@boots-coots.com; bill.sheridan@boots-coots.com; joe.kennedy@boots-coots.com			3/14/2016 12:11	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
996		Alan Gosse <Alan.Gosse@Halliburton.com>	Alan Gosse <Alan.Gosse@Halliburton.com>; Lane, Bret <JLane@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Razavi, Avideh <ARazavi2@semprautilities.com>; De La Rosa, Andy <ADeLaRosa2@semprautilities.com>; donwshackelford@yahoo.com; peteslagel@1816drilling.com; morten.haug.emilsen@addenergy.no; Arash Haghshenas			1/30/2016 17:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
997		Orellana, Jennifer <jorella2@enova.com>	Orellana, Jennifer <JOrellana2@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/2/2016 10:59	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
998		Tracy, Jill <jtracy@enova.com>	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'jim.lagrone@boots-coots.com'; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Ali Reza <reza@exponent.com>; Ng, Deana M <DNg@semprautilities.com>; Orellana, Jennifer <JOrellana2@semprautilities.com>			4/25/2016 11:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
999	AC_CPUC_0188539	McMahon, Thomas D. <TMcMahon@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>	Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; 'John Garner' <Jgarner@boots-coots.com>		9/8/2017 22:18	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1000	AC_CPUC_0188548	McMahon, Thomas D. <tptdm@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Dentici, Roberto <RDentici@semprautilit ies.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Clorfeine, Sabina B. <SClorfeine@sempraut ilities.com>; Healy, Gregory <GHealy@semprautiliti es.com>	Andrews, Larry J <LAndrews@semprautilities.co m>; Smith, Christopher J <CSmith8@semprautilities.com >; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor .com>; 'John Garner' <Jgarner@boots-coots.com>		9/8/2017 22:18	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1001	AC_CPUC_0188530	Unspecified Sender	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Dentici, Roberto <RDentici@semprautilit ies.com>; La Fevers, Glenn <GLaFevers@sempra utilities.com>; Clorfeine, Sabina B. <SClorfeine@sempraut ilities.com>; Healy, Gregory <GHealy@semprautiliti es.com>	Andrews, Larry J <LAndrews@semprautilities.co m>; Smith, Christopher J <CSmith8@semprautilities.com >; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor .com>; John Garner <Jgarner@boots-coots.com>		9/8/2017 22:16	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1002		Frescas, Arturo <AFrescas@semprautil ities.com>	'Eliasian, Maghdi' <maghdi.eliasian@mor ganlewis.com>; Haley McIntosh <hmmcintosh@jonesda y.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.co m>		8/18/2016 12:40	Email sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.
1003		Eliasian, Maghdi <maghdi.eliasian@mor ganlewis.com>	Haley McIntosh <hmmcintosh@jonesda y.com>; Frescas, Arturo <AFrescas@semprautil ities.com>	Healy, Gregory <GHealy@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Mortazavi, Setareh <SMortazavi@semprautilities.co m>		8/18/2016 12:28	Email sent from counsel providing legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1004		La Fevers, Glenn <GLaFevers@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50	Email sent internally reflecting legal advice regarding company response to agency data requests.
1005		John Walters - B&C <jwalters@boots-coots.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 10:18	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1006		Chechitelli, Frank <FChechitelli@semprautilities.com>	'John Walters - B&C' <jwalters@boots-coots.com>	Leonardo Portillo <lportillo@boots-coots.com>; Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>		4/7/2016 9:45	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1007	AC_CPUC_0183727	Chechitelli, Frank <FChechitelli@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>			4/6/2016 14:30	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1008		Tracy, Jill <jtracy@enova.com>	Chechitelli, Frank <FChechitelli@sempra utilities.com>; Navin, Neil <NNavin@sempratiliti es.com>; Hobbs, Rick <RHobbs@sempratiliti es.com>; Lee, Karen I <KLee5@sempratilitie s.com>; Sanders, Cole B <CSanders2@sempra utilities.com>; Brandy, Carla L. <CBrandy@sempratilit ies.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; Hesam, H. Tony <Thesam@sempratiliti es.com>	'jwalters@boots-coots.com'		4/6/2016 14:20	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1009		Unspecified Sender	Chechitelli, Frank <FChechitelli@sempra utilities.com>; Navin, Neil <NNavin@sempratiliti es.com>; Hobbs, Rick <RHobbs@sempratiliti es.com>; Lee, Karen I <KLee5@sempratilitie s.com>; Sanders, Cole B <CSanders2@sempra utilities.com>; Brandy, Carla L. <CBrandy@sempratilit ies.com>; Van de Putte, Todd <TVandePutte@sempr autilities.com>; Hesam, H. Tony <Thesam@sempratiliti es.com>	'jwalters@boots-coots.com'		4/6/2016 14:20	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1010		Chechitelli, Frank <FChechitelli@sempra utilities.com>	Navin, Neil <NNavin@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:10	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1011	AC_CPUC_0183706	Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@sempra utilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1012		Ng, Deana M <dmng@enova.com>	Ng, Deana M <DNg@semprautilities.com>; Dozier, Mike <MDozier@semprautilities.com>; Volkmar, Mike <MVolkmar@semprautilities.com>; jim.lagrone@boots-coots.com; Haley McIntosh (hmmcintosh@jonesday.com)			8/23/2016 14:07	Email sent from counsel providing legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1013		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Dozier, Mike <MDozier@semprautilities.com>	DL_B&C Engineering <engineering@boots-coots.com>; DL_B&C Well Control <wellcontrol@boots-coots.com>; DL_Wellsure <DL_Wellsure@halliburton.com>		4/26/2016 8:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1014						4/26/2016 8:19	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1015		Ng, Deana M <DNg@semprautilities.com>	Dozier, Mike <MDozier@semprautilities.com>; Volkmar, Mike <MVolkmar@semprautilities.com>; jim.lagrone@boots-coots.com; Haley McIntosh (hmmcintosh@jonesday.com)			8/23/2016 14:07	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
1016	AC_CPUC_0183882	Schwecke, Rodger <rschwecke@enova.com>	Ng, Deana M <DNg@semprautilities.com>			4/18/2016 7:36	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1017	AC_CPUC_0183709	Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1018		Tracy, Jill <JTracy@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>	'jwalters@boots-coots.com'		4/6/2016 14:20	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1019	AC_CPUC_0183695	Navin, Neil <NNavin@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/5/2016 21:49	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1020		Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>		4/5/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1021						4/5/2016 13:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1022	AC_CPUC_0183598	Navin, Neil <NNavin@sempratutilities.com>	Hesam, H. Tony <Thesam@sempratutilities.com>; Chechitelli, Frank <FChechitelli@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempratutilities.com>; Greenwade, Lynn N. <LNGreenwade@sempratutilities.com>; Hobbs, Rick <RHobbs@sempratutilities.com>; Langan, Ken <KLangan@sempratutilities.com>; Sanders, Cole B <CSanders2@sempratutilities.com>; Lee, Karen I <KLee5@sempratutilities.com>		4/4/2016 14:38	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1023	AC_CPUC_0183544	Navin, Neil <NNavin@sempratutilities.com>	Chechitelli, Frank <FChechitelli@sempra utilities.com>	Van de Putte, Todd <TVandePutte@sempratutilities.com>; Hesam, H. Tony <Thesam@sempratutilities.com>; Greenwade, Lynn N. <LNGreenwade@sempratutilities.com>; Hobbs, Rick <RHobbs@sempratutilities.com>; Langan, Ken <KLangan@sempratutilities.com>; Sanders, Cole B <CSanders2@sempratutilities.com>; Lee, Karen I <KLee5@sempratutilities.com>		4/4/2016 8:33	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1024		Van de Putte, Todd <tvandepu@enova.com>	Tracy, Jill <JTracy@sempratutilities.com>; La Fevers, Glenn <GLaFevers@sempratutilities.com>; Navin, Neil <NNavin@sempratutilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44	Email sent internally reflecting legal advice regarding company response to agency data requests.
1025		Unspecified Sender	Tracy, Jill <JTracy@sempratutilities.com>; La Fevers, Glenn <GLaFevers@sempratutilities.com>; Navin, Neil <NNavin@sempratutilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1026		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Razavi, Avideh <ARazavi2@semprautilities.com>		4/20/2016 8:28	Email sent internally reflecting legal advice regarding gas standards.
1027		Navin, Neil <NNavin@semprautilities.com>	Guy Fox <gfox@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Joseph Kennedy <Joseph.Kennedy@halliburton.com>; Razavi, Avideh <ARazavi2@semprautilities.com>		4/20/2016 7:57	Email sent internally reflecting legal advice regarding gas standards.
1028		Guy Fox <gfox@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Joseph Kennedy <Joseph.Kennedy@halliburton.com>		4/20/2016 6:08	Email sent internally reflecting legal advice regarding gas standards.
1029		Van de Putte, Todd <tvandepu@enova.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/18/2016 13:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1030		Unspecified Sender	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>			4/18/2016 13:17	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1031		Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 10:24	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1032		Navin, Neil <NNavin@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>		4/6/2016 10:16	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1033	AC_CPUC_0183700	Van de Putte, Todd <tvandepu@enova.com>	Navin, Neil <NNavin@semprautilities.com>			4/6/2016 6:30	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1034	AC_CPUC_0183697	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			4/6/2016 6:30	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1035	AC_CPUC_0183693	Chechitelli, Frank <FChechitelli@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/5/2016 17:48	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1036		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Navin, Neil <NNavin@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>	Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>		4/5/2016 17:47	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1037		Jim LaGrone <Jim.LaGrone@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Brandy, Carla L. <CBrandy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>		4/5/2016 13:27	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1038	AC_CPUC_0183540	Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 7:59	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1039						4/4/2016 7:59	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1040		La Fevers, Glenn <glafever@enova.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50	Email sent internally reflecting legal advice regarding company response to agency data requests.
1041		Unspecified Sender	Van de Putte, Todd <TVandePutte@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:50	Email sent internally reflecting legal advice regarding company response to agency data requests.
1042	AC_CPUC_0183703	Navin, Neil <NNavin@semprautilities.com>	Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1043		Van de Putte, Todd <TVandePutte@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:44	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1044		Navin, Neil <NNavin@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Jim LaGrone' <Jim.LaGrone@boots-coots.com>			9/6/2016 10:42	Email sent internally reflecting legal advice regarding company response to agency data requests.
1045	AC_CPUC_0183712	Navin, Neil <nnavin@enova.com>	Navin, Neil <NNavin@semprautilities.com>; Chechitelli, Frank <FChechitelli@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>		4/6/2016 8:32	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1046	AC_CPUC_0187500	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Jim.LaGrone@boots-coots.com; Rolly Gomez <rgomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>		9/30/2016 7:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1047	AC_CPUC_0187448	Van de Putte, Todd <TVandePutte@semprautilities.com>	'Jim LaGrone' <Jim.LaGrone@boots-coots.com>; Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/28/2016 8:45	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1048	AC_CPUC_0187431	Tracy, Jill <JTracy@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		9/27/2016 19:27	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1049	AC_CPUC_0187413	Dentici, Roberto <719373e031c64d8596e05b6c846ac744-dentici, roberto@enova.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		9/27/2016 19:24	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1050	AC_CPUC_0187404	Tracy, Jill <JTracy@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		9/27/2016 19:16	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1051	AC_CPUC_0187388	Dentici, Roberto <719373e031c64d8596e05b6c846ac744-dentici, roberto@enova.com>	Tracy, Jill <JTracy@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>		9/27/2016 19:14	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1052	AC_CPUC_0187381	Jim LaGrone <Jim.LaGrone@boots-coots.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>; Tracy, Jill <JTracy@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>; Hamze, Firas <FHamze@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>		9/27/2016 18:59	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1053	AC_CPUC_0188558	McMahon, Thomas D. <TMcMahon@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Dentici, Roberto <RDentici@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Clorfeine, Sabina B. <SClorfeine@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.com>; Smith, Christopher J <CSmith8@semprautilities.com>; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor.com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:35	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1054	AC_CPUC_0188557	Schwecke, Rodger <RSchwecke@sempra utilities.com>	McMahon, Thomas D. <TMcMahon@semprau tilities.com>	Dentici, Roberto <RDentici@semprautilities.com >; La Fevers, Glenn <GLaFevers@semprautilities.co m>; Clorfeine, Sabina B. <SClorfeine@semprautilities.co m>; Healy, Gregory <GHealy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.co m>; Smith, Christopher J <CSmith8@semprautilities.com >; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor .com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:13	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1055	AC_CPUC_0188560	McMahon, Thomas D. <tptdm@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Dentici, Roberto <RDentici@semprautilities.com >; La Fevers, Glenn <GLaFevers@semprautilities.co m>; Clorfeine, Sabina B. <SClorfeine@semprautilities.co m>; Healy, Gregory <GHealy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.co m>; Smith, Christopher J <CSmith8@semprautilities.com >; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor .com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:35	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1056	AC_CPUC_0188562	TMcMahon@semprauti lities.com	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Dentici, Roberto <RDentici@semprautilities.com >; La Fevers, Glenn <GLaFevers@semprautilities.co m>; Clorfeine, Sabina B. <SClorfeine@semprautilities.co m>; Healy, Gregory <GHealy@semprautilities.com>; Andrews, Larry J <LAndrews@semprautilities.co m>; Smith, Christopher J <CSmith8@semprautilities.com >; BALDWIN, DONALD (Contractor) <DBALDWIN3@SEUContractor .com>; John Garner <Jgarner@boots-coots.com>		9/9/2017 7:35	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1057	AC_CPUC_0188965	Navin, Neil <nnavin@enova.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>; Kitson, Amy <AKitson@sempratiliti es.com>; Ng, Deana M <DNg@semprautilities. com>; Neville, Dan <DNeville@semprautilit ies.com>; Tracy, Jill <JTracy@semprautilitie s.com>			7/1/2016 10:53	Email sent to counsel requesting legal advice regarding company response to SS-25 leak and public relations and media inquiries about the SS-25 leak.
1058	AC_CPUC_0189363	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Neville, Dan <DNeville@semprautilit ies.com>	Kitson, Amy <AKitson@semprautilities.com> ; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 10:47	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1059	AC_CPUC_0189361	Neville, Dan <DNeville@semprautilit ies.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Kitson, Amy <AKitson@semprautilities.com> ; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 10:34	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1060	AC_CPUC_0189354	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Neville, Dan <DNeville@semprautilit ies.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/10/2016 9:36	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1061	AC_CPUC_0189352	Schwecke, Rodger <rschwecke@enova.co m>	Kitson,Amy <AKitson@semprautiliti es.com>	Neville,Dan <DNeville@semprautilities.com >; Navin,Neil <NNavin@semprautilities.com>		12/10/2016 9:35	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1062	AC_CPUC_0189347	Kitson, Amy <AKitson@semprautiliti es.com>	Neville, Dan <DNeville@semprautilit ies.com>	Schwecke, Rodger <RSchwecke@semprautilities.c om>; Navin, Neil <NNavin@semprautilities.com>		12/9/2016 20:38	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1063	AC_CPUC_0189346	Neville, Dan <DNeville@semprautilit ies.com>	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 19:30	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1064	AC_CPUC_0189343	Schwecke, Rodger <RSchwecke@sempra utilities.com>	Neville, Dan <DNeville@semprautilit ies.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 17:43	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1065	AC_CPUC_0188981	Ng, Deana M <DNg@semprautilities. com>	Navin, Neil <NNavin@semprautiliti es.com>			7/1/2016 11:53	Email sent internally reflecting legal advice regarding company response to the SS25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1066	AC_CPUC_0188977	Ng, Deana M <DNg@semprautilities.com>	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>		7/1/2016 11:09	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
1067	AC_CPUC_0188975	Tracy, Jill <JTracy@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>; Ng, Deana M <DNg@semprautilities.com>; Neville, Dan <DNeville@semprautilities.com>		7/1/2016 11:02	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
1068	AC_CPUC_0183542	Chechitelli, Frank <FChechitelli@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Hesam, H. Tony <Thesam@semprautilities.com>; Greenwade, Lynn N. <LNGreenwade@semprautilities.com>; Hobbs, Rick <RHobbs@semprautilities.com>; Langan, Ken <KLangan@semprautilities.com>; Sanders, Cole B <CSanders2@semprautilities.com>; Lee, Karen I <KLee5@semprautilities.com>		4/4/2016 7:59	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1069						4/4/2016 7:59	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and gas standards.
1070	AC_CPUC_0188979	Navin, Neil <nnavin@enova.com>	Ng,Deana M			7/1/2016 11:36	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
1071	AC_CPUC_0188963	Navin, Neil <nnavin@enova.com>	Schwecke,Rodger; Kitson,Amy; Ng,Deana M; Neville,Dan; Tracy,Jill			7/1/2016 10:53	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
1072	AC_CPUC_0185564	La Fevers, Glenn <GLaFevers@semprautilities.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			8/10/2016 9:36	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
1073	AC_CPUC_0185563	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	La Fevers, Glenn <GLaFevers@semprautilities.com>			8/10/2016 9:05	Email sent internally reflecting legal advice regarding company response to the SS25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1074		Unspecified Sender	Tracy, Jill <JTracy@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; La Fevers, Glenn <GLaFevers@semprautilities.com>; Hamze, Firas <FHamze@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; 'Rolando Gomez' <Rolando.Gomez@boots-coots.com>	Shapiro, Daniel <DShapiro@semprautilities.com>; Kysar, Scott <SKysar@semprautilities.com>		4/14/2016 9:12	Email sent internally reflecting legal advice regarding company response to the SS25 leak.
1075	AC_CPUC_0183384	Navin, Neil <NNavin@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			3/18/2016 16:31	Email sent internally reflecting legal advice regarding risk registry.
1076	AC_CPUC_0183369	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 11:44	Email sent internally reflecting legal advice regarding risk registry.
1077	AC_CPUC_0183365	Navin, Neil <NNavin@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			3/18/2016 11:41	Email sent internally reflecting legal advice regarding risk registry.
1078	AC_CPUC_0183355	Unspecified Sender	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 8:30	Email sent internally reflecting legal advice regarding risk registry.
1079	AC_CPUC_0183371	Kitson, Amy <awahl@enova.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 11:44	Email sent internally reflecting legal advice regarding risk registry.
1080	AC_CPUC_0183361	Kitson, Amy <awahl@enova.com>	Navin, Neil <NNavin@semprautilities.com>			3/18/2016 8:40	Email sent internally reflecting legal advice regarding risk registry.
1081		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>		5/22/2017 6:58	Email sent from counsel providing legal advice regarding gas standards.
1082		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:58	Email sent to counsel requesting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1083		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 13:29	Email sent to counsel requesting legal advice regarding gas standards.
1084		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/12/2017 12:39	Email sent to counsel requesting legal advice regarding gas standards.
1085		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>		5/11/2017 14:36	Email sent to counsel requesting legal advice regarding gas standards.
1086		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:50	Email sent internally reflecting legal advice regarding gas standards.
1087		Kitson, Amy <awahl@enova.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40	Email sent internally reflecting legal advice regarding gas standards.
1088		Kitson, Amy <awahl@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/11/2017 13:38	Email sent internally reflecting legal advice regarding gas standards.
1089		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>			5/11/2017 7:40	Email sent internally reflecting legal advice regarding gas standards.
1090		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36	Email sent internally reflecting legal advice regarding gas standards.
1091		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		5/2/2017 11:49	Email sent to counsel requesting legal advice regarding gas standards.
1092		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 10:05	Email sent internally reflecting legal advice regarding gas standards.
1093	AC_CPUC_0189397	Neville, Dan <tpdgn@enova.com>	Egbert, Thomas <TEgbert@semprautilities.com>			1/5/2017 8:46	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1094	AC_CPUC_0189394	Unspecified Sender	Egbert, Thomas <TEgbert@semprautilities.com>			1/5/2017 8:46	Email sent internally reflecting legal advice regarding company response to agency data requests.
1095	AC_CPUC_0189392	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>			12/21/2016 14:25	Email sent internally reflecting legal advice regarding company response to agency data requests.
1096	AC_CPUC_0189388	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>; Dentici, Roberto <RDentici@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>			12/21/2016 14:24	Email sent internally reflecting legal advice regarding company response to agency data requests.
1097	AC_CPUC_0189369	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 13:39	Email sent internally reflecting legal advice regarding company response to agency data requests.
1098	AC_CPUC_0189365	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 13:39	Email sent internally reflecting legal advice regarding company response to agency data requests.
1099	AC_CPUC_0189358	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:54	Email sent internally reflecting legal advice regarding company response to agency data requests.
1100	AC_CPUC_0189355	Unspecified Sender	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:53	Email sent internally reflecting legal advice regarding company response to agency data requests.
1101	AC_CPUC_0189350	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:34	Email sent internally reflecting legal advice regarding company response to agency data requests.
1102	AC_CPUC_0189348	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>		12/10/2016 9:34	Email sent internally reflecting legal advice regarding company response to agency data requests.
1103	AC_CPUC_0189344	Neville, Dan <tpdgn@enova.com>	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 18:30	Email sent internally reflecting legal advice regarding company response to agency data requests.
1104	AC_CPUC_0189345	DNeville@semprautilities.com	Schwecke, Rodger <RSchwecke@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>		12/9/2016 18:30	Email sent internally reflecting legal advice regarding company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1105	AC_CPUC_0189400	Egbert, Thomas <TEgbert@semprautilities.com>	Neville, Dan <DNeville@semprautilities.com>			1/5/2017 8:47	Email sent internally reflecting legal advice regarding company response to agency data requests.
1106	AC_CPUC_0188486	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			3/20/2017 13:29	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1107	AC_CPUC_0188483	Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			3/20/2017 8:12	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1108	AC_CPUC_0188480	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			3/17/2017 13:42	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1109		Jim LaGrone <Jim.LaGrone@boots-coots.com>	ndodoo@semprautiliteis.com	Rolando Gomez <Rolando.Gomez@boots-coots.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>; John Garner <Jgarner@boots-coots.com>		3/15/2017 12:51	Email and Attachments sent internally reflecting legal advice regarding gas standards.
1110						3/15/2017 12:51	Email and Attachments sent internally reflecting legal advice regarding gas standards.
1111		Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/13/2017 18:57	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1112	AC_CPUC_0188216	Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			2/1/2017 8:22	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
1113	AC_CPUC_0188214	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			1/31/2017 15:12	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
1114	AC_CPUC_0188174	Van de Putte, Todd <tvandepu@enova.com>	jgarner@boots-coots.com			1/30/2017 11:30	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
1115		Van de Putte, Todd <tvandepu@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 9:32	Email sent internally reflecting legal advice regarding gas standards.
1116		Unspecified Sender	Dodoo, Nii Amoo <NDodoo@semprautilities.com>; Kitson, Amy <AKitson@semprautilities.com>	Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>		3/6/2017 9:26	Email sent internally reflecting legal advice regarding gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1117		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>			3/3/2017 11:39	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1118		Van de Putte, Todd <tvandepu@enova.co m>	John Garner <Jgarner@boots-coots.com>			3/3/2017 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1119						3/3/2017 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1120						3/3/2017 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1121		Van de Putte, Todd <tvandepu@enova.co m>	'John Garner' <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprau tilities.com>			3/2/2017 10:33	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1122						3/2/2017 10:33	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1123						3/2/2017 10:33	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1124		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprau tilities.com>			3/2/2017 10:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1125						3/2/2017 10:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1126						3/2/2017 10:32	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1127	AC_CPUC_0188471	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@sempr autilities.com>			2/24/2017 13:34	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1128	AC_CPUC_0188469	Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>			2/24/2017 13:03	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1129		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/24/2017 13:03	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1130	AC_CPUC_0188467	John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/24/2017 11:33	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1131		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/22/2017 14:06	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1132		Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			2/22/2017 13:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1133		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/22/2017 13:25	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1134		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/22/2017 10:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1135		Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/21/2017 17:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1136						2/21/2017 17:07	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1137		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/21/2017 17:07	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1138		Van de Putte, Todd <tvandepu@enova.com>	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/21/2017 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1139						2/21/2017 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1140						2/21/2017 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1141						2/21/2017 15:00	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1142		Unspecified Sender	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/21/2017 15:00	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1143	AC_CPUC_0188320	Van de Putte, Todd <tvandepu@enova.com>	John Garner <Jgarner@boots-coots.com>			2/20/2017 20:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1144		Van de Putte, Todd <tvandepu@enova.com>	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/17/2017 21:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1145						2/17/2017 21:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1146		Unspecified Sender	McMahon, Thomas D. <TMcMahon@semprautilities.com>; John Garner <Jgarner@boots-coots.com>			2/17/2017 21:45	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1147		Van de Putte, Todd <tvandepu@enova.com>	'John Garner' <Jgarner@boots-coots.com>			2/15/2017 11:41	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1148		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/15/2017 11:38	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1149		John Garner <Jgarner@boots-coots.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>			2/15/2017 11:33	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1150		McMahon, Thomas D. <TMcMahon@semprautilities.com>	Van de Putte, Todd <TVandePutte@semprautilities.com>	John Garner <Jgarner@boots-coots.com>		2/13/2017 19:06	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1151		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; McMahon, Thomas D. <TMcMahon@semprautilities.com>			2/13/2017 18:56	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1152		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/13/2017 10:37	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1153						2/13/2017 10:37	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1154		Unspecified Sender	John Garner <Jgarner@boots-coots.com>			2/1/2017 7:27	Email sent internally reflecting legal advice regarding company response to SS-25 leak.
1155		Unspecified Sender	jgarner@boots-coots.com			1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1156						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1157						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1158						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1159						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1160						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1161						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1162						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1163						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1164						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1165						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1166						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1167						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1168						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1169						1/30/2017 11:30	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and potential litigation.
1170		Unspecified Sender	John Garner <Jgarner@boots-coots.com>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Rolando Gomez <Rolando.Gomez@boots-coots.com>			12/5/2016 7:55	Email sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1171		Navin, Neil <nnavin@enova.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1172		Kitson, Amy <AKitson@semprautilities.com>	Navin, Neil <NNavin@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:40	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1173	AC_CPUC_0170583	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:12	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
1174	AC_CPUC_0170581	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:12	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
1175	AC_CPUC_0170579	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:12	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
1176	AC_CPUC_0170577	Petrizzo, Hilary E <7957911c867c4a23bf65558f32762b9f-petrizzo, hilary e@enova.com>	Logan, David M <DLogan@sempra.com>			11/30/2017 20:11	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak.
1177	AC_CPUC_0170586	Logan, David M <DLogan@sempra.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			12/1/2017 9:07	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
1178	AC_CPUC_0170585	Logan, David M <DLogan@sempra.com>	Petrizzo, Hilary E <HPetrizzo@semprautilities.com>			11/30/2017 21:37	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
1179	AC_CPUC_0188772	Razavi, Avideh <arazavi1@enova.com>	Mortazavi, Setareh <SMortazavi@semprautilities.com>			12/21/2017 14:13	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1180		Navin, Neil <NNavin@semprautilities.com>	Kitson, Amy <AKitson@semprautilities.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/11/2017 13:44	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1181		Dodoo, Nii Amoo <dnamoo@enova.com>	Kitson, Amy <AKitson@semprautilities.com>; Van de Putte, Todd <TVandePutte@semprautilities.com>			5/3/2017 8:36	Email sent internally reflecting legal advice regarding company response to SS-25 leak and gas standards.
1182		Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>	Jim.LaGrone@boots-coots.com; Rolando.Gomez@boots-coots.com	Lotterman, Thomas R. <thomas.lotterman@morganlewis.com>; Tran, Johnny Q <JQTran@semprautilities.com>; Dodoo, Nii Amoo <NDodoo@semprautilities.com>		5/3/2017 8:24	Email sent from counsel providing legal advice regarding company response to SS-25 leak and gas standards.
1183		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1184						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1185		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	mdonovan@capstonefire.com	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; pwilliams@capstonefire.com		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1186		Rodriguez, Sonia <srodrig3@enova.com>	Lawler, Alexandra G <AGLawler@sempra.com>	Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Tanenbaum, Jeffrey <jtanenbaum@nixonpeabody.com>; Wagher, Ed <EWagher@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Buczkowski, David L <DBuczkowski@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1187		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1188						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1189		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1190		Rodriguez, Sonia <SRodriguez3@sempr autilities.com>	Robert Salgado <rsalgado@dir.ca.gov>	Kerns, Barry <BKerns@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.c om>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1191						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1192		Rodriguez, Sonia <srodrig3@enova.com >	Kerns, Barry <BKerns@semprautiliti es.com>; Wagher, Ed <EWagher@semprautil ities.com>; Ibay, Isaac <IIbay@semprautilities. com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1193						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1194						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1195		Schwecke, Rodger <RSchwecke@sempra utilities.com>	Rodriguez, Sonia <SRodriguez3@sempr autilities.com>	Ibay, Isaac <IIbay@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1196		Salazar, Jeff <JLSalazar@semprauti lities.com>	Salgado, Robert@DIR <RSalgado@dir.ca.gov >	Rodriguez, Sonia <SRodriguez3@semprautilities. com>; Kerns, Barry <BKerns@semprautilities.com>; Efron, Mary Ann@DIR <MEfron@dir.ca.gov>; Schwecke, Rodger <RSchwecke@semprautilities.c om>; Cho, Jimmie I <JCho@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1197						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1198						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1199						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1200						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1201						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1202						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1203						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1204						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1205						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1206						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1207		Cho, Jimmie I <JCho@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1208		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	jim.lagrone@boots-coots.com; mbagget@boots-coots.com; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1209		Kerns, Barry <BKerns@semprautilities.com>	Mike Baggett <mbaggett@boots-coots.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Salgado, Robert@DIR <RSalgado@dir.ca.gov>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1210						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1211		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1212		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1213						10/6/2016 9:25	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1214		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1215						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1216		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	mdonovan@capstonefire.com	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; pwilliams@capstonefire.com		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1217		Rodriguez, Sonia <srodrig3@enova.com>	Lawler, Alexandra G <AGLawler@sempra.com>	Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Healy, Gregory <GHealy@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Tanenbaum, Jeffrey <jtanenbaum@nixonpeabody.com>; Wagher, Ed <EWagher@semprautilities.com>; Salazar, Jeff <JLSalazar@semprautilities.com>; Buczkowski, David L <DBuczkowski@semprautilities.com>; Navin, Neil <NNavin@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent to counsel requesting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1218		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1219						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1220		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1221		Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Robert Salgado <rsalgado@dir.ca.gov>	Kerns, Barry <BKerns@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>; Lane, Bret <JLane@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Schwecke, Rodger <RSchwecke@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1222						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1223		Rodriguez, Sonia <srodrig3@enova.com>	Kerns, Barry <BKerns@semprautilities.com>; Wagher, Ed <EWagher@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1224						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1225						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1226		Schwecke, Rodger <RSchwecke@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	Ibay, Isaac <IIbay@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1227		Salazar, Jeff <JLSalazar@semprautilities.com>	Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Efron, Mary Ann@DIR <MEfron@dir.ca.gov>; Schwecke, Rodger <RSchwecke@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Ibay, Isaac <IIbay@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1228						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1229						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1230						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1231						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1232						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1233						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1234						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1235						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1236						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1237						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1238		Cho, Jimmie I <JCho@semprautilities.com>	Kerns, Barry <BKerns@semprautilities.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1239		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>	jim.lagrone@boots-coots.com; mbagget@boots-coots.com; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1240		Kerns, Barry <BKerns@semprautilities.com>	Mike Baggett <mbaggett@boots-coots.com>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Salgado, Robert@DIR <RSalgado@dir.ca.gov>; Jim LaGrone <Jim.LaGrone@boots-coots.com>; Cho, Jimmie I <JCho@semprautilities.com>; Snyder, Hal <HSnyder@semprautilities.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1241						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1242		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Michael Donovan <mdonovan@capstonefire.com>	mbaggett@boots-coots.com; Rodriguez, Sonia <SRodriguez3@semprautilities.com>; Kerns, Barry <BKerns@semprautilities.com>; Cho, Jimmie I <JCho@semprautilities.com>; Patrick Williams <pwilliams@capstonefire.com>		10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1243		Salgado, Robert@DIR <RSalgado@dir.ca.gov>	Rodriguez, Sonia <SRodriguez3@semprautilities.com>			10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1244						10/6/2016 9:28	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak and company response to agency data requests.
1245		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Sharepoint <Sharepoint@semprautilities.com>; SempraHelp <SempraHelp@sempra.com>	Tran, Johnny Q <JQTran@semprautilities.com>; Cerrillos, Jorge <JCerrillos@semprautilities.com>; mmunoz@boots-coots.com		7/18/2017 6:36	Email sent to counsel requesting legal advice regarding company response to SS-25 leak.
1246		Cerrillos, Jorge <tpjsc@enova.com>	Miguel Munoz <mmunoz@boots-coots.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>		7/13/2017 14:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1247						7/13/2017 14:56	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1248		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/12/2017 6:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1249						7/12/2017 6:46	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1250		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/12/2017 6:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1251						7/12/2017 6:39	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1252		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			7/11/2017 6:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1253						7/11/2017 6:41	Email and Attachments sent internally reflecting legal advice regarding company response to SS-25 leak.
1254		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	mmunoz@boots-coots.com	Cerrillos, Jorge <JCerrillos@semprautilities.com>		6/13/2017 8:13	Email sent internally reflecting legal advice regarding company response to SS-25 leak.

Doc #	Prod Beg CPUC	Email From	Email To	Email CC	Email BCC	Parent Date	Description
1255		Cerrillos, Jorge <tpjsc@enova.com> - on behalf of - Egan, Jason W <jwegan@enova.com>	mmunoz@boots-coots.com			6/1/2017 18:57	Email sent from counsel providing legal advice regarding company response to SS-25 leak.
1256		JCerrillos@semprautilities.com	mmunoz@boots-coots.com			6/1/2017 18:57	Email sent internally reflecting legal advice regarding company response to agency data requests.
1257		Miguel Munoz <mmunoz@boots-coots.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			6/1/2017 18:56	Email sent internally reflecting legal advice regarding company response to agency data requests.
1258		Cerrillos, Jorge <tpjsc@enova.com>	Miguel Munoz <mmunoz@boots-coots.com>			6/1/2017 18:54	Email sent internally reflecting legal advice regarding company response to agency data requests.
1259		JCerrillos@semprautilities.com	Miguel Munoz <mmunoz@boots-coots.com>			6/1/2017 18:54	Email sent internally reflecting legal advice regarding company response to agency data requests.
1260		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 9:01	Email sent internally reflecting legal advice regarding company response to agency data requests.
1261		Cerrillos, Jorge <tpjsc@enova.com>	Dodoo, Nii Amoo <NDodoo@semprautilities.com>			5/26/2017 8:59	Email sent internally reflecting legal advice regarding company response to agency data requests.
1262		Dodoo, Nii Amoo <NDodoo@semprautilities.com>	Cerrillos, Jorge <JCerrillos@semprautilities.com>			5/26/2017 8:58	Email sent internally reflecting legal advice regarding company response to agency data requests.

SoCalGas Supplemental Response to Question 2b of I1906016 Safety and Enforcement Division Data Request 64

FA

FTP Admin

To Gruen, Darryl; Sher, Nicholas

Reply | Reply All | Forward | ...

Fri 5/15/2020 11:29 PM

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Attached please find SoCalGas' supplemental response (including attachments) to Question 2b of CPUC-SED's data request 64 dated April 6, 2020 relative to I.19-06-016. Please note that the attached information contains confidential and protected materials submitted pursuant to PUC Section 583, GO 66-D, and D.17-09-023. In addition, an updated privilege log is also included in this response.

Please let me know if you have any questions. Thanks.

Gregory Healy
Regulatory Business Manager
Regulatory Affairs - Special Projects
Southern California Gas Company
PH: (213) 244-3314
ghealy@socalgas.com

SoCalGas Supplemental Response to Question 2b of I1906016 Safety and Enforcement Division Data Request 64

FA

FTP Admin

To Gruen, Darryl; Sher, Nicholas

Reply | Reply All | Forward | ...

Fri 5/15/2020 11:29 PM

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Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

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Attached please find SoCalGas' supplemental response (including attachments) to Question 2b of CPUC-SED's data request 64 dated April 6, 2020 relative to I.19-06-016. Please note that the attached information contains confidential and protected materials submitted pursuant to PUC Section 583, GO 66-D, and D.17-09-023. In addition, an updated privilege log is also included in this response.

Please let me know if you have any questions. Thanks.

Gregory Healy
Regulatory Business Manager
Regulatory Affairs - Special Projects
Southern California Gas Company
PH: (213) 244-3314
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COLUMNS PROVIDED IN SOCALGAS ATTORNEY-CLIENT PRIVILEGE LOGS RELATED TO SED DATA R
QUESTION 10, Data Request 21, and Data Request 64, Question 2

Doc #	Prod Beg CPUC SED DR 16	Email From	Email To	Email CC	Email BCC	Parent Date

REQUEST 16

ADDITIONAL SAFETY AND ENFORCEMENT DIVISION QUESTIONS IN DATA

Description	Was document released to Safety and Enforcement Division?	If document has been released to SED, date of release.	Bates Number(s) of document(s) Released to SED.

REQUEST 93 (COLUMNS J THROUGH AK)

Did the released document contain a related document(s)?	"Was the related document(s) released also?"	If the related document was released, Bates Number(s) of Released Document	If the related document was not released, why not?

Has the released document been duplicated to SED?	If the released document has been duplicated to SED, identify Bates Number(s) of all duplicates.	Did the released document contain any redacted information?	Reason for continued redaction in released document.	Bates number(s) where redacted information appears.	Basis for alleged privilege shown in "Description" column (Column I).

Where Legal Advice Was Shown as Provided in Column I, Name of Attorney Who Provided Legal Advice	Where Legal Advice Was Shown as Provided in Column I, Date that Attorney in Column W Provided Legal Advice	Where Legal Advice Was Shown as Provided in Column I, Form of Communication in Which Attorney Dispensed Legal Advice

Where Legal Advice Was Shown as Provided in Column I, and the Individual Making the Communication Was Not an Attorney, Was the Individual Making the Communication Doing So As Part of Her or His Pre-Existing Formal Job Description?	Where an attorney name is provided in column W, was that attorney representing SoCalGas, Boots & Coots or someone else?	Where the attorney name provided in column W worked for a law	Was the entry released outside of SoCalGas?	If the answer to column "AC" is yes, to which person(s) and/or entity (entities) was the entry released?

Chain of Communication from attorney (column W) to the indivic

Date of release to each person(s) or entity (entities) identified in column AD.	Date and Time of Communication from Attorney Who Provided Legal Advice (Column W)	Recipients of Communication from Attorney who Provided Legal Advice	Name(s) of Recipient(s) Who Passed on Legal Advice from Attorney Listed in Column W to Individual on the Privilege Log Who Made the Allegedly Privileged Communication

dual uttering the communication shown on the SoCalGas logs (Columns AF through AK).

Date and time of Communication from Recipients Who Passed on Legal Advice from Attorney Listed in Column W to Individual on the Privilege Log Who Made the Allegedly Privileged Communication	Method of Communication from Recipients Who Passed on Legal Advice from Attorney Listed in Column W to the Individual Who Made the Allegedly Privileged Communication	Recipients of Communication from Recipients (Column AH) Who Passed on Legal Advice from Attorney Listed in Column W

I.19-06-016 DATA REQUEST / PRELIMINARY INVESTIGATION RELATED TO SOUTHERN CALIFORNIA GAS COMPANY'S ALISO CANYON FACILITY

Data Request No: SED 93

Date of this Request: May 19, 2020

Date Responses Due: **On or before May 29, 2020**

To: Avisha Patel
Email: APatel@semprautilities.com

From: Darryl Gruen
California Public Utilities Commission Legal Division
Staff Counsel
415-703-1973

Originated by: Darryl Gruen
Email: djg@cpuc.ca.gov
Phone: (415)703-1973

Cc:
Nicholas Sher
Darryl Gruen

INSTRUCTIONS

You are instructed to answer the following Data Requests in the above-captioned proceeding, with written, verified responses per Public Utilities Code §§ 309.5, 314, 314.5, 581 and 582, and Rules 1.1 and 10.1 of the California Public Utilities Commission's Rules of Practice and Procedure. Restate the text of each request prior to providing the response. For any questions, email the SED contact(s) above with a copy to the SED attorney. These data requests should be considered continuing so that if any information provided changes, or new information becomes available that is responsive to a request, respondent is requested to supplement its response to SED.

If the respondent objects to any of these data requests, please submit specific objections within five business days. If respondent asserts any privilege, please provide within ten business days a privilege log listing all documents the respondent claims are privileged and the following information for each document: the basis for the privilege claimed, a summary of the purpose and subject of the document withheld, the date of the document, the author(s), and all recipients of the document.

In responding to each request please restate the text of the request prior to providing the response, and provide the name of the person(s) answering the request, the title of such person(s), and the name and title of the person they work for. With respect to each document produced, identify the number of the data request and question number that the document is responding to.

These data requests do not-supersede or excuse any pending oral data requests to the respondent unless that is expressly stated in the written data request.

Identify the person providing the answer to each data request and his/her contact information. Responses should be provided both in the original electronic format, if available, and in hard copy. (If available in Word format, send the Word document and do not send the information as a PDF file.) All electronic documents submitted in response to this data request should be in readable, downloadable, printable, and searchable formats, unless use of such formats is infeasible. Each page should be numbered. If any of your answers refer to or reflect calculations, provide a copy of the supporting electronic files that were used to derive such calculations, such as Excel-compatible spreadsheets or computer programs, with data and formulas intact and functioning. Documents produced in response to the data requests should be Bates-numbered, and indexed if voluminous. Responses to data requests that refer to or incorporate documents should identify the particular documents referenced by Bates-numbers or Bates-range.

If a request, definition, or an instruction, is unclear, notify SED as soon as possible. In any event, answer the request to the fullest extent possible, specifying the reason for your inability to answer the remaining portion of the Data Request.

In answering these data requests, the respondent should adhere to the Commission's Rules of Practice and Procedure (Rules), with particular attention to Rule 1.1 of those Rules, which requires the respondent to "never mislead the Commission or its staff by an

artifice or false statement of law of fact." The respondent should keep in mind that "Violations of Rule 1.1 can occur by a failure to correctly cite a proposition of law, *a lack of candor*, withholding information, providing incorrect information, or a failure to correct mistaken information."[1] SED expects the respondent to respond to these data requests with the highest level of candor.

<u>If SoCalGas does not intend to provide a complete substantive answer to a question, objections to each such question are due May 22, 2020. Otherwise, objections may accompany the answer to a question on the due date for the data response. As this Data Request also has a certain level of complexity, SED invites and encourages SoCalGas to promptly request a meet and confer with SED regarding the questions in this data request to the extent SoCalGas does not understand the questions asked, so that SoCalGas can precisely identify any points of confusion and requests for clarification.</u>

DEFINITIONS

Unless the request indicates otherwise, the following definitions are applicable in providing the requested information.

1. The terms "document," "documents,", "documentary material", or "documentation" include, without limitation, the following items, whether in electronic form, printed, recorded, or written or reproduced by hand: reports, studies, statistics, projections, forecasts, decisions, and orders, intra-office and interoffice communications, correspondence, memoranda, financial data, summaries or records of conversations or interviews, statements, returns, diaries, calendars, work papers, graphs, notebooks, notes, charts, computations, plans, drawings, sketches, computer printouts, summaries of records of meetings or conferences, summaries or reports of investigations or negotiations, opinions or reports of consultants, photographs, bulletins, records or representations or publications of any kind (including microfilm, videotape, and records however produced or reproduced), electronic or mechanical or electrical records of any kind (including, without limitation, tapes, tape cassettes, discs, emails, and records) other data compilations (including without limitation, input/output files, source codes, object codes, program documentation, computer programs, computer printouts, cards, tapes, discs and recordings used in automated data processing, together with the programming instructions and other material necessary to translate, understand, or use the same), and other documents or tangible things of whatever description which constitute or contain information within the scope of these data requests.

2. "Relating to" or "related to" means concerning, addressing, referring, discussing, commenting

   upon, analyzing, mentioning or involving in any way.

3. "Identify":

[1] Administrative Law Judge's Ruling Denying Southern California Edison Company's Motion For Summary Adjudication Of Alleged Rule 1.1 Violations Related To Data Request Responses Dated December 10, 2010, I.09-01-018, January 10, 2012, p. 6.

a. When used in reference to a person includes stating his or her full name, his or her most recent known business address and telephone number, and his or her present title or position;

b. When used in reference to documents includes stating the nature of the document (e.g., letter, memorandum), the date (if any), the title of the document, the identity of the author and/or the document, the location of the document, the identity of the person having possession, control or custody of the document, and the general subject matter of the document.

4. "CPUC" as used herein refers to the California Public Utilities Commission.

5. "SED" as used herein refers to the Safety and Enforcement Division.

6. "SCG" or "SoCalGas" as used herein refers to the Southern California Gas Company and/or its affiliates.

Questions

Please note that this Data Request applies to each entry for which SoCalGas asserted privilege in response to SED Data Request 16, Question 10, including each SoCalGas' update to that Data Request question.[1] The questions in this data request accompany the spreadsheet entitled, "Document for SoCalGas to Fill in as Part of Data Request 93". Unless shown otherwise, each question in this document explains the information that SoCalGas is requested to fill in under each column heading in the spreadsheet. Unless specific instructions are otherwise provided in a question, SED requests that the entry in each column of the attached spreadsheet be filled out for each entry shown in the SoCalGas privilege logs that are responsive to SED Data Request 16, Question 10, and Data Request 21. SED also requests that the spreadsheet be populated with information from SoCalGas response to SED Data Request 64, Question 2, where applicable.

1. Compile all of the privilege logs that SoCalGas has provided SED which are responsive to SED Data Request 16, Question 10.
2. Provide the information from SoCalGas' privilege logs in columns B through H, which match the column headings that SoCalGas provided from its privilege logs.
3. Column J-"Was Document Released to Safety and Enforcement Division? " Entries in this column should be a yes or no answer. Namely, if the entry on the privilege log has since been provided to SED, a yes answer is requested in the corresponding row with the entry under this column. If the entry on the privilege log has not been provided to SED, a no answer is requested in the corresponding row with the entry under this column.
4. Column K-"If document has been released to SED, date of release." Entries in this column are limited to those documents identified on the log that have been released to SED. For such entries, provide the date the document in the entry was released.
5. Column L-"Bates Number(s) of document(s) released to SED." Entries in this column should identify the Bates Number or Bates Numbers that have been released that are associated with the entry.
6. Column M-"Did the released document contain a related document?" Entries in this column apply to released documents only. For each released document, identify whether it had a related document. Examples of related documents include the following: For released email attachments, related documents would include emails to which the attachment was attached. For released emails, related documents would include the attachments that were attached to the email. If the released document in the corresponding row had a related document, answer yes. If not, answer no. If there is more than one document related to the one that was released, provide a separate entry for each related document. For example, if a released email had two email attachments, each email attachment will need an entry.
7. Column N-"Was the related document(s) released also?" Entries in this column apply to released documents that contained related documents, and therefore received an answer of "yes" in column N. If a document was released, and its related document was also released, answer "yes". If a document was released, and any its related document were not released, answer "no".
8. Column O-"If the related document was released, Bates Number(s) of Released Document." Entries in this column apply to related documents identified in column M that were also released. For example, if an email was released, and its attachment was also released, provide the Bates number of the released email

[1] In addition, this Data Request applies to SoCalGas' response to SED Data Request 21, which requested that SoCalGas highlight attorney names on the privilege log provided in response to Data Request 16 Question 10. This Data Request also applies to SoCalGas response to SED Data Request 64, Question 2, in which SoCalGas allegedly de-designated responses that were part of the log that SoCalGas provided in response to Data Request 16, Question 10.

attachment. Similarly, if an attachment was released, and its related email was released, provide the Bates number of the released email.

9. Column P-"If the related document was not released, why not?" Entries in this column apply to related documents identified in column M that were not released. This column is requesting an explanation as to the reason why even though an allegedly privileged document has been released, a related document still has a valid privilege.
10. Column Q-"Has the released document been duplicated?" Entries in this column apply to documents that have been provided by SoCalGas to SED in duplicate. For example, an email thread that was provided more than one time, but with one additional email added to it would fall into this category. All of the portions of the email thread that are duplicated by another released document provided by SoCalGas would fall into this category.
11. Column R-"If the released document has been duplicated, to SED, identify Bates Number(s) of all duplicates." Entries in this column should include the Bates number or Bates numbers on all documents that duplicated the Bates number document entered in column L. Note: A duplicate is defined as an email page that was duplicated, and not by the exact image of on the Bates numbered document. For example, if an email thread was provided across two separate Bates numbers or sets of Bates numbers, that email thread is a duplicate, regardless if the exact same part of the email thread happened to fall on the same Bates stamped document or not. If a portion of a Bates number has not been duplicated (such as a unique addition to an email thread, do not include that Bates number as a duplicate).
12. Column S-"Did the released document contain any redacted information? " Entries in this column apply to released documents that still contain redacted information. Such entries should receive a "yes" response.
13. Column T-"Reason for continued redaction in released document". Entries in this column apply to the entries in column S that received a "yes" response. Such entries should receive a renewed description for the reason that the alleged privilege continues to apply to such a redaction.
14. Column U-"Bates number(s) where redacted information appears." Entries in this column apply to the entries in column S that received a "yes" response. Such entries should include the Bates number or Bates numbers in this column that show the redacted information.
15. Column V-"Basis for alleged privilege shown in "Description" column (Column I). For all privilege logs entries that SoCalGas provided in response to SED Data Request 16, Question 10, and that SoCalGas has now released to SED, provide the valid basis as to why SoCalGas initially asserted the privilege. For such entries, please be sure to include the document itself and how it complied with the explanation of the privilege in the "description" column. For example, most of the entries in the description column included the words "reflecting legal advice" about a subject area. For such entries, please explain how the released document "reflected legal advice" in the subject area provided in the description column.
16. Column W-"Where Legal Advice Was Provided in Column I, Name of Attorney Who Provided Legal Advice". Entries in this column should name the attorney who provided the legal advice where legal advice was shown in the description column (column I). This entry is needed, as many of the entries in the initial attorney-client privilege log entries do not show the name of the attorney who dispensed the advice in the communications, so it is not apparent whether the communication is validly protected under the alleged privilege.
17. Column X-"Where Legal Advice Was Shown As Provided in Column I, Date and Time that Attorney in Column W Provided Legal Advice". Entries in this column should show the date and time that the attorney who is named in column W provided the legal advice under the "Description" provided in the log under column I.
18. Column Y-"Where Legal Advice Was Shown as Provided in Column I, Form of Communication in Which Attorney Dispensed Legal Advice." Entries in this column should show the form (method) of communication in which the attorney identified in column W dispensed the advice identified in column I. For example, if the advice was dispensed via email, then email should be included in the entry. If the advice was dispensed via email and verbally, then both entries should be included in this column. If the advice was dispensed only verbally, then SED reserves the right to request an affidavit or similar declaration under penalty of perjury from the attorney identified under column W who is shown as having provided the advice.

19. Column Z-"Where Legal Advice Was Shown as Provided in Column I, and the Individual Making the Communication Was Not an Attorney, Was the Individual Making the Communication Doing So As Part of Her or His Pre-Existing Formal Job Description?" Entries in this column should be "Yes" or "No". If the "description" column shows legal advice was dispensed, and the individual making the allegedly privileged communication was not an attorney, and that individual was making the communication as part of his or her job description, then an entry of "yes" is requested. If the individual making the allegedly privileged communication was not an attorney, but the individual was making a communication that was not part of her or his pre-existing formal job description, then an entry of "no" is requested.
20. Provide the pre-existing job description for each individual asked about in response to question 17.
21. Column AA-"Where an attorney name is provided in column W, was that attorney representing SoCalGas, Boots & Coots or someone else?" Entries in this column should show the entity that the attorney represented.
22. Column AB-"Where the attorney name provided in column W worked for a law firm, provide the name of the firm." Entries in this column refer to outside counsel who worked for a law firm. Provide the name of the law firm for which that attorney worked at the time she or he dispensed the advice.
23. Column AC-"Was the entry released outside of SoCalGas?" Entries in this column should have a "yes" answer if the entry on the privilege log consisted of a communication (including documents that were part of that communication) that were released outside of SoCalGas.
24. Column AD-"If the answer to column "AC" is yes, to which person(s) and/or entity (entities) was the entry released?" This column should identify all entities that received the released communication. This includes, but is not limited to, Sempra Utilities, Boots & Coots, and plaintiffs in the civil litigation related SoCalGas Aliso Canyon natural gas storage facility incident that began October 23, 2015.
25. Column AE-"Date of release to each person(s) or entity (entities) identified in column AD." This entry is requested to identify the date that each entry was released to each person(s) or entity or entities identified in column AD.
26. Columns AF through AK-"Chain of Communication from attorney (column W) to the individual uttering the communication shown on the SoCalGas logs." These columns are requested to show that there was a clear chain of communication from the attorney who communicated the legal advice to the individual listed on the SoCalGas log who uttered the legal advice. As one example, multiple entries under the "Description" column of SoCalGas' privilege log uses the words "reflecting legal advice". In such instances, it is unclear from this the exact chain of communication from the attorney who gave the legal advice to the individual who is shown on the log who made the communication. With this general instruction, the instruction for each specific column from AF through AJ is shown below.

    These columns are premised on the assumption that the attorney listed in column W did not directly communicate her or his legal advice to the person who made the allegedly privileged statement shown on the SoCalGas privilege log. Ultimately, these columns are requested to be filled in to show the exact line of individuals through which the attorney's advice in Column W was received by the person shown on the privilege log to have made the allegedly privileged communication. Additional necessary columns should be added to show the entire line of communication from the attorney in column W to the individual shown making the allegedly privileged communication in the privilege log. Such columns are requested to include the names of each group of recipients of the attorney's legal advice (for example, see column AH), the date and time those recipients made communications to pass on the attorney's advice from column W (for example, see column AI), the method of communication from those recipients toward the individual shown on the privilege log (for example, see column AJ), and the next group of recipients of the attorney's advice (for example, see column AK).

    a. Column AF- "Date and Time of Communication from Attorney Who Provided Legal Advice (Column W)"-This is a request to show the exact date and time that the attorney who dispensed the

legal advice that was followed for each privilege log entry. For example, where the privilege log uses the words "reflecting legal advice" under the "description" column, column AF is requested to provide the date and time the attorney in column W communicated the legal advice that was reflected in the description column of the privilege log.

b. Column AG-"Recipients of Communication from Attorney who Provided Legal Advice"-This is a request to show all recipients who received the legal advice at from the attorney (column W) who dispensed the legal advice that was followed for each entry in the privilege log. For example, where the privilege log uses the words "reflecting legal advice" under the "description" column, column AG is requested to provide all recipients who received the communication from the attorney listed in column W, and at the date and time that attorney communicated that legal advice (column AF).

c. Column AH-"Name(s) of Recipients Who Passed on Legal Advice from Attorney Listed in Column W to Individual on the Privilege Log Who Made the Allegedly Privileged Communication." This column requests the name of the recipient(s) who passed on the attorney's advice that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

d. Column AI-"Date and Time of Communication from Recipients Who Passed on Legal Advice from Attorney Listed in Column W to Individual on the Privilege Log Who Made the Allegedly Privileged Communication." This column requests the date and time in which the recipients (listed in Column AH) passed on the advice from the attorney (Column W) that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

e. Column AJ-"Method of Communication from Recipients Who Passed on Legal Advice from Attorney Listed in Column W to the Individual Who Made the Allegedly Privileged Communication." This column requests the method of communication in which the recipients (listed in Column AH) passed on the advice from the attorney (Column W) that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

f. Column AK-"Recipients of Communication from Recipients (Column AH) Who Passed on Legal Advice from the Attorney Listed in Column W". This column requests the names of the recipients who received the communication from the recipients listed in column AH and who then passed on that advice from the attorney listed in column W that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

27. Provide the date in which SoCalGas initially provided the allegedly privileged log entry to SED.
28. Replicate on the spreadsheet that is part of this data request all of the highlighted entries showing the attorney names provided in response to SED Data Request 21.
29. Provide the requested spreadsheet in native file format so that SED can do sorting and see a complete document.

Please send your response to the Originator, and a copy of your response to Project Coordinator and e-copies to the following SED representatives:

Nicholas.sher@cpuc.ca.gov
Darryl.gruen@cpuc.ca.gov

Please provide the above information as it becomes available but no later than the due date identified above. If you are unable to provide the information by this date, please notify the Originator **at least** 3 days before the data request is due and provide your best estimate of when the information can be provided. Please identify the person who provides the response and his/her phone number and email address.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-93 DATED MAY 19, 2020)

SOCALGAS RESPONSE DATED JUNE 8, 2020

SoCalGas provides the following Responses to tbhe Safety and Enforcement Division (SED) data request dated May 19, 2020 in I.19-06-016. The Responses are based upon the best available, nonprivileged information that SoCalGas was able to locate through a diligent search within the time allotted to respond to this request, and within SoCalGas' possession, custody, or control. SoCalGas' responses do not include information collected or modeled by Blade Energy Partners' during its Root Cause Analysis Investigation. SoCalGas reserves the right to supplement, amend or correct the Responses to the extent that it discovers additional responsive information.

SoCalGas objects to the instructions submitted by SED and to the continuing and indefinite nature of this request on the grounds that they are overbroad and unduly burdensome. Special interrogatory instructions of this nature and continuing interrogatories are expressly prohibited by California Code of Civil Procedure Section 2030.060(d) and 2030.060(g), respectively. SoCalGas will provide responsive documents in existence at the time of its response. Should SED seek to update its request, SoCalGas will respond to such a request as a new data request in the future.

SoCalGas submits these Responses, while generally objecting to any Request that fails to provide a defined time period to which SoCalGas may tailor its Response, and to the extent that any Request is overly broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas further submits these Responses without conceding the relevance of the subject matter of any Request or Response. SoCalGas reserves the right to object to use of these Responses, or information contained therein, in any dispute, matter or legal proceeding. Finally, at the time of this Response, there are no pending oral data requests from SED to SoCalGas.

Questions:

Please note that this Data Request applies to each entry for which SoCalGas asserted privilege in response to SED Data Request 16, Question 10, including each SoCalGas' update to that Data Request question.1 The questions in this data request accompany the spreadsheet entitled, "Document for SoCalGas to Fill in as Part of Data Request 93". Unless shown otherwise, each question in this document explains the information that SoCalGas is requested to fill in under each column heading in the spreadsheet. Unless specific instructions are otherwise provided in a question, SED requests that the entry in each column of the attached spreadsheet be filled out for each entry shown in

the SoCalGas privilege logs that are responsive to SED Data Request 16, Question 10, and Data Request 21. SED also requests that the spreadsheet be populated with information from SoCalGas response to SED Data Request 64, Question 2, where applicable.

QUESTION 1:

Compile all of the privilege logs that SoCalGas has provided SED which are responsive to SED Data Request 16, Question 10.

RESPONSE 1:

SoCalGas objects to this request to the extent that it fails to ask a question. SoCalGas further objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED.

QUESTION 2:

Provide the information from SoCalGas' privilege logs in columns B through H, which match the column headings that SoCalGas provided from its privilege logs.

RESPONSE 2:

SoCalGas objects to this request on the ground it is unduly burdensome and seeks information that has already been provided to SED.

QUESTION 3:

Column J-"Was Document Released to Safety and Enforcement Division? " Entries in this column should be a yes or no answer. Namely, if the entry on the privilege log has since been provided to SED, a yes answer is requested in the corresponding row with the entry under this column. If the entry on the privilege log has not been provided to SED, a no answer is requested in the corresponding row with the entry under this column.

RESPONSE 3:

SoCalGas objects to this request on the grounds it is unduly burdensome; seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer call on May 28, 2020.

QUESTION 4:

Column K-"If document has been released to SED, date of release." Entries in this column are limited to those documents identified on the log that have been released to SED. For such entries, provide the date the document in the entry was released.

RESPONSE 4:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates.

QUESTION 5:

Column L-"Bates Number(s) of document(s) released to SED." Entries in this column should identify the Bates Number or Bates Numbers that have been released that are associated with the entry.

RESPONSE 5:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer on May 28, 2020.

QUESTION 6:

Column M-"Did the released document contain a related document?" Entries in this column apply to released documents only. For each released document, identify

whether it had a related document. Examples of related documents include the following: For released email attachments, related documents would include emails to which the attachment was attached. For released emails, related documents would include the attachments that were attached to the email. If the released document in the corresponding row had a related document, answer yes. If not, answer no. If there is more than one document related to the one that was released, provide a separate entry for each related document. For example, if a released email had two email attachments, each email attachment will need an entry.

RESPONSE 6:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer on May 28, 2020.

QUESTION 7:

Column N-"Was the related document(s) released also?" Entries in this column apply to released documents that contained related documents, and therefore received an answer of "yes" in column N. If a document was released, and its related document was also released, answer "yes". If a document was released, and any its related document were not released, answer "no".

RESPONSE 7:

SoCalGas objects to this request on the grounds it is unduly burdensome; seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer call on May 28, 2020.

QUESTION 8:

Column O-"If the related document was released, Bates Number(s) of Released Document." Entries in this column apply to related documents identified in column M that were also released. For example, if an email was released, and its attachment was

also released, provide the Bates number of the released email attachment. Similarly, if an attachment was released, and its related email was released, provide the Bates number of the released email.

RESPONSE 8:

SoCalGas objects to this request on the grounds it is unduly burdensome; and seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer call on May 28, 2020.

QUESTION 9:

Column P-"If the related document was not released, why not?" Entries in this column apply to related documents identified in column M that were not released. This column is requesting an explanation as to the reason why even though an allegedly privileged document has been released, a related document still has a valid privilege.

RESPONSE 9:

SoCalGas objects to this request on the grounds it is unduly burdensome; seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer call on May 28, 2020.

QUESTION 10:

Column Q-"Has the released document been duplicated?" Entries in this column apply to documents that have been provided by SoCalGas to SED in duplicate. For example, an email thread that was provided more than one time, but with one additional email added to it would fall into this category. All of the portions of the email thread that are duplicated by another released document provided by SoCalGas would fall into this category.

RESPONSE 10:

SoCalGas objects to this request on the grounds it is unduly burdensome; seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer call on May 28, 2020; and is vague and ambiguous with respect to the term "duplicated." Moreover, SoCalGas objects to this request to the extent it fails to acknowledge that documents were provided in duplicate to SED at SED's request.

QUESTION 11:

Column R-"If the released document has been duplicated, to SED, identify Bates Number(s) of all duplicates." Entries in this column should include the Bates number or Bates numbers on all documents that duplicated the Bates number document entered in column L. Note: A duplicate is defined as an email page that was duplicated, and not by the exact image of on the Bates numbered document. For example, if an email thread was provided across two separate Bates numbers or sets of Bates numbers, that email thread is a duplicate, regardless if the exact same part of the email thread happened to fall on the same Bates stamped document or not. If a portion of a Bates number has not been duplicated (such as a unique addition to an email thread, do not include that Bates number as a duplicate).

RESPONSE 11:

SoCalGas objects to this request on the grounds it is unduly burdensome; seeks information that has already been provided to SED to the extent the documents have been provided to SED; and is vague and ambiguous with respect to the term "duplicated." Moreover, SoCalGas objects to this request to the extent it fails to acknowledge that documents were provided in duplicate to SED at SED's request.

QUESTION 12:

Column S-"Did the released document contain any redacted information? " Entries in this column apply to released documents that still contain redacted information. Such entries should receive a "yes" response.

RESPONSE 12:

SoCalGas objects to this request on the grounds it is unduly burdensome; and seeks information that has already been provided to SED to the extent the documents have been provided along with a revised privilege log to reflect updates, as explained to SED during a meet-and-confer call on May 28, 2020.

QUESTION 13:

Column T-"Reason for continued redaction in released document". Entries in this column apply to the entries in column S that received a "yes" response. Such entries should receive a renewed description for the reason that the alleged privilege continues to apply to such a redaction.

RESPONSE 13:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED to the extent SED has been provided with a current privilege log.

QUESTION 14:

Column U-"Bates number(s) where redacted information appears." Entries in this column apply to the entries in column S that received a "yes" response. Such entries should include the Bates number or Bates numbers in this column that show the redacted information.

RESPONSE 14:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED to the extent SED has been provided with a current privilege log.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-93 DATED MAY 19, 2020)

SOCALGAS RESPONSE DATED JUNE 8, 2020

QUESTION 15:

Column V-"Basis for alleged privilege shown in "Description" column (Column I). For all privilege logs entries that SoCalGas provided in response to SED Data Request 16, Question 10, and that SoCalGas has now released to SED, provide the valid basis as to why SoCalGas initially asserted the privilege. For such entries, please be sure to include the document itself and how it complied with the explanation of the privilege in the "description" column. For example, most of the entries in the description column included the words "reflecting legal advice" about a subject area. For such entries, please explain how the released document "reflected legal advice" in the subject area provided in the description column.

RESPONSE 15:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED, and moreover calls for a legal conclusion.

QUESTION 16:

Column W-"Where Legal Advice Was Provided in Column I, Name of Attorney Who Provided Legal Advice". Entries in this column should name the attorney who provided the legal advice where legal advice was shown in the description column (column I). This entry is needed, as many of the entries in the initial attorney-client privilege log entries do not show the name of the attorney who dispensed the advice in the communications, so it is not apparent whether the communication is validly protected under the alleged privilege.

RESPONSE 16:

SoCalGas objects to this request on the grounds it is unduly burdensome and seeks information that has already been provided to SED to the extent SED has been provided with a current privilege log, as explained to SED during a meet-and-confer call on May 28, 2020.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-93 DATED MAY 19, 2020)

SOCALGAS RESPONSE DATED JUNE 8, 2020

QUESTION 17:

Column X-"Where Legal Advice Was Shown As Provided in Column I, Date and Time that Attorney in Column W Provided Legal Advice". Entries in this column should show the date and time that the attorney who is named in column W provided the legal advice under the "Description" provided in the log under column I.

RESPONSE 17:

SoCalGas objects to this request on the grounds it is unduly burdensome, seeks information that has already been provided to SED, seeks information outside the scope of the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019, and is not reasonably calculated to lead to the discovery of admissible information pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure.

QUESTION 18:

Column Y-"Where Legal Advice Was Shown as Provided in Column I, Form of Communication in Which Attorney Dispensed Legal Advice." Entries in this column should show the form (method) of communication in which the attorney identified in column W dispensed the advice identified in column I. For example, if the advice was dispensed via email, then email should be included in the entry. If the advice was dispensed via email and verbally, then both entries should be included in this column. If the advice was dispensed only verbally, then SED reserves the right to request an affidavit or similar declaration under penalty of perjury from the attorney identified under column W who is shown as having provided the advice.

RESPONSE 18:

SoCalGas objects to this request on the grounds it is unduly burdensome, seeks information outside the scope of the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019, is not reasonably calculated to lead to the discovery of admissible information pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure, and is unintelligible to the extent it seeks information regarding "verbal" advice given in documents identified on a privilege log.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-93 DATED MAY 19, 2020)

SOCALGAS RESPONSE DATED JUNE 8, 2020

QUESTION 19:

Column Z-"Where Legal Advice Was Shown as Provided in Column I, and the Individual Making the Communication Was Not an Attorney, Was the Individual Making the Communication Doing So As Part of Her or His Pre-Existing Formal Job Description?" Entries in this column should be "Yes" or "No". If the "description" column shows legal advice was dispensed, and the individual making the allegedly privileged communication was not an attorney, and that individual was making the communication as part of his or her job description, then an entry of "yes" is requested. If the individual making the allegedly privileged communication was not an attorney, but the individual was making a communication that was not part of her or his pre-existing formal job description, then an entry of "no" is requested.

RESPONSE 19:

SoCalGas objects to this request on the ground it is unintelligible and vague and ambiguous with reference to the phrase, "Pre-Existing Formal Job Description." SoCalGas further objects to this request to the extent that information that has already been provided to SED, as explained to SED during a meet-and-confer call on May 28, 2020.

QUESTION 20:

Provide the pre-existing job description for each individual asked about in response to question 17.

RESPONSE 20:

SoCalGas objects to this request on the ground it is unintelligible and vague and ambiguous with reference to the phrase, "Pre-Existing Formal Job Description." SoCalGas further objects to this request on the grounds it is unduly burdensome, seeks information outside the scope of the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019, and is not reasonably calculated to lead to the discovery of admissible information pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure.

QUESTION 21:

Column AA-"Where an attorney name is provided in column W, was that attorney representing SoCalGas, Boots & Coots or someone else?" Entries in this column should show the entity that the attorney represented.

RESPONSE 21:

SoCalGas objects to this request to the extent it is unduly burdensome and seeks information that has already been provided to SED.

QUESTION 22:

Column AB-"Where the attorney name provided in column W worked for a law firm, provide the name of the firm." Entries in this column refer to outside counsel who worked for a law firm. Provide the name of the law firm for which that attorney worked at the time she or he dispensed the advice.

RESPONSE 22:

SoCalGas objects to this request to the extent it is unduly burdensome and seeks information that has already been provided to SED.

QUESTION 23:

Column AC-"Was the entry released outside of SoCalGas?" Entries in this column should have a "yes" answer if the entry on the privilege log consisted of a communication (including documents that were part of that communication) that were released outside of SoCalGas.

RESPONSE 23:

SoCalGas objects to this request to the extent it is unduly burdensome and is vague and ambiguous and unintelligible with respect to the phrase, "released outside of SoCalGas." SoCalGas further objects to the extent that the request fails to identify a timeframe for which SoCalGas can tailor its response. SoCalGas further objects to this

request to the extent it is outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019 and is not reasonably calculated to lead to the discovery of admissible evidence pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure.

QUESTION 24:

Column AD-"If the answer to column "AC" is yes, to which person(s) and/or entity (entities) was the entry released?" This column should identify all entities that received the released communication. This includes, but is not limited to, Sempra Utilities, Boots & Coots, and plaintiffs in the civil litigation related SoCalGas Aliso Canyon natural gas storage facility incident that began October 23, 2015.

RESPONSE 24:

SoCalGas objects to this request to the extent it is unduly burdensome and is vague and ambiguous and unintelligible with respect to the phrase, "released outside of SoCalGas." SoCalGas further objects to this request to the extent it is outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019 and is not reasonably calculated to lead to the discovery of admissible evidence pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure.

QUESTION 25:

Column AE-"Date of release to each person(s) or entity (entities) identified in column AD." This entry is requested to identify the date that each entry was released to each person(s) or entity or entities identified in column AD.

RESPONSE 25:

SoCalGas objects to this request to the extent it is unduly burdensome and is vague and ambiguous and unintelligible with respect to the phrase, "released outside of SoCalGas." SoCalGas further objects to this request to the extent it is outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019 and is not reasonably calculated to lead to

the discovery of admissible evidence pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure.

QUESTION 26.a:

Columns AF through AK-"Chain of Communication from attorney (column W) to the individual uttering the communication shown on the SoCalGas logs." These columns are requested to show that there was a clear chain of communication from the attorney who communicated the legal advice to the individual listed on the SoCalGas log who uttered the legal advice. As one example, multiple entries under the "Description" column of SoCalGas' privilege log uses the words "reflecting legal advice". In such instances, it is unclear from this the exact chain of communication from the attorney who gave the legal advice to the individual who is shown on the log who made the communication. With this general instruction, the instruction for each specific column from AF through AJ is shown below.

These columns are premised on the assumption that the attorney listed in column W did not directly communicate her or his legal advice to the person who made the allegedly privileged statement shown on the SoCalGas privilege log. Ultimately, these columns are requested to be filled in to show the exact line of individuals through which the attorney's advice in Column W was received by the person shown on the privilege log to have made the allegedly privileged communication. Additional necessary columns should be added to show the entire line of communication from the attorney in column W to the individual shown making the allegedly privileged communication in the privilege log. Such columns are requested to include the names of each group of recipients of the attorney's legal advice (for example, see column AH), the date and time those recipients made communications to pass on the attorney's advice from column W (for example, see column AI), the method of communication from those recipients toward the individual shown on the privilege log (for example, see column AJ), and the next group of recipients of the attorney's advice (for example, see column AK).

a. Column AF- "Date and Time of Communication from Attorney Who Provided Legal Advice (Column W)"-This is a request to show the exact date and time that the attorney who dispensed the legal advice that was followed for each privilege log entry. For example, where the privilege log uses the words "reflecting legal

advice" under the "description" column, column AF is requested to provide the date and time the attorney in column W communicated the legal advice that was reflected in the description column of the privilege log.

RESPONSE 26.a:

SoCalGas objects to this request to the extent it is outside the scope of this proceeding as determined by the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019 and is overly burdensome and not reasonably calculated to lead to the discovery of admissible evidence pursuant to Rule 10.1 of the Commission's Rules of Practice and Procedure. SoCalGas further objects to the extent this question duplicates other questions in this Data Request 93.

QUESTION 26.b:

b. Column AG-"Recipients of Communication from Attorney who Provided Legal Advice"-This is a request to show all recipients who received the legal advice at from the attorney (column W) who dispensed the legal advice that was followed for each entry in the privilege log. For example, where the privilege log uses the words "reflecting legal advice" under the "description" column, column AG is requested to provide all recipients who received the communication from the attorney listed in column W, and at the date and time that attorney communicated that legal advice (column AF).

RESPONSE 26.b:

SoCalGas objects to this request to the extent it is unduly burdensome, is vague and ambiguous, and seeks information already provided to SED.

QUESTION 26.c:

c. Column AH-"Name(s) of Recipients Who Passed on Legal Advice from Attorney Listed in Column W to Individual on the Privilege Log Who Made the Allegedly Privileged Communication." This column requests the name of the recipient(s) who passed on the attorney's advice that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

RESPONSE 26.c:

SoCalGas objects to this request to the extent it is unduly burdensome, is vague and ambiguous, and seeks information already provided to SED.

QUESTION 26.d:

d. Column AI-"Date and Time of Communication from Recipients Who Passed on Legal Advice from Attorney Listed in Column W to Individual on the Privilege Log Who Made the Allegedly Privileged Communication." This column requests the date and time in which the recipients (listed in Column AH) passed on the advice from the attorney (Column W) that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

RESPONSE 26.d:

SoCalGas objects to this request to the extent it is unduly burdensome, is vague and ambiguous, seeks information already provided to SED, and is not reasonably calculated to lead to the discovery of admissible evidence.

QUESTION 26.e:

e. Column AJ-"Method of Communication from Recipients Who Passed on Legal Advice from Attorney Listed in Column W to the Individual Who Made the Allegedly Privileged Communication." This column requests the method of communication in which the recipients (listed in Column AH) passed on the advice from the attorney (Column W) that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

RESPONSE 26.e:

SoCalGas objects to this request on the grounds it is unduly burdensome, seeks information outside the scope of the Assigned Commissioner's Scoping Memo and Ruling dated September 26, 2019, is not reasonably calculated to lead to the discovery of admissible information pursuant to Rule 10.1 of the Commission's Rules of Practice

and Procedure, and is unintelligible to the extent it seeks information regarding the method of communication in documents identified on a privilege log.

QUESTION 26.f:

f. Column AK-"Recipients of Communication from Recipients (Column AH) Who Passed on Legal Advice from the Attorney Listed in Column W". This column requests the names of the recipients who received the communication from the recipients listed in column AH and who then passed on that advice from the attorney listed in column W that ultimately was received by the individual who made the allegedly privileged communication on the privilege log.

RESPONSE 26.f:

SoCalGas objects to this request to the extent it is unduly burdensome, is vague and ambiguous, seeks information already provided to SED, and is not reasonably calculated to lead to the discovery of admissible evidence.

QUESTION 27:

Provide the date in which SoCalGas initially provided the allegedly privileged log entry to SED.

RESPONSE 27:

SoCalGas objects to this request on the grounds the request is vague and ambiguous with respect to the phrase "the alleged privileged log entry," and thus unintelligible. SoCalGas also objects to this request on the ground it is argumentative. SoCalGas further objects to this request to the extent that it seeks information that is equally available to SED.

QUESTION 28:

Replicate on the spreadsheet that is part of this data request all of the highlighted entries showing the attorney names provided in response to SED Data Request 21.

ORDER INSTITUTING INVESTIGATION ON THE COMMISSION'S OWN MOTION INTO THE OPERATIONS AND PRACTICES OF SOUTHERN CALIFORNIA GAS COMPANY WITH RESPECT TO THE ALISO CANYON STORAGE FACILITY AND THE RELEASE OF NATURAL GAS, AND ORDER TO SHOW CAUSE WHY SOUTHERN CALIFORNIA GAS COMPANY SHOULD NOT BE SANCTIONED FOR ALLOWING THE UNCONTROLLED RELEASE OF NATURAL GAS FROM ITS ALISO CANYON STORAGE FACILITY (I.19-06-016)

SOUTHERN CALIFORNIA GAS COMPANY

(DATA REQUEST SED-SCG-93 DATED MAY 19, 2020)

SOCALGAS RESPONSE DATED JUNE 8, 2020

RESPONSE 28:

SoCalGas objects to this request on the ground it is unintelligible. SoCalGas further objects to this request to the extent that the information sought has already been provided to SED, or is equally available to SED.

QUESTION 29:

Provide the requested spreadsheet in native file format so that SED can do sorting and see a complete document.

RESPONSE 29:

SoCalGas objects to this request on the grounds it is vague and ambiguous with respect to the phrase "complete document."

DATA REQUEST for Safety and Enforcement Division Preliminary Investigation of Southern California Gas Company in the Matter of the Aliso Canyon Well Leak

Data Request No: SED-Aliso-SoCalGas – 12FEB18

Date of this Request: February 12, 2018

Date Responses Due: **On or before February 26, 2018**

To: Sabina Clorfeine
SClorfeine@semprautilities.com

From: Safety and Enforcement Division
505 Van Ness Avenue
San Francisco, CA 94102

320 West 4th St.
Suite 500
Los Angeles, CA 90013

Attention: Randy Holter: Staff Engineer
Email:

Originated by: Randy Holter
Email: rh3@cpuc.ca.gov
Phone: (213) 576-7153

Cc: Mr. Kenneth Bruno
Mr. Nicholas Sher
Mr. Darryl Gruen

INSTRUCTIONS

You are instructed to answer the following Data Requests in the above-captioned proceeding, with written, verified responses per Public Utilities Code §§ 314, 314.5, 581 and 582, and Rules 1.1 and 10.1 of the California Public Utilities Commission's Rules of Practice and Procedure. Restate the text of each request prior to providing the response. For any questions, email the SEF contact(s) above with a copy to the SED program manager and attorneys.

These data requests should be considered continuing so that if any information provided changes, or new information becomes available that is responsive to a request, respondent is requested to supplement its response to SED.

If the respondent objects to any of these data requests, please submit specific objections within five business days. If respondent asserts any privilege, please provide within ten business days a privilege log listing all documents the respondent claims are privileged and the following information for each document: the basis for the privilege claimed, a summary of the purpose and subject of the document withheld, the date of the document, the author(s), and all recipients of the document.

In responding to each request please restate the text of the request prior to providing the response, and provide the name of the person(s) answering the request, the title of such person(s), and the name and title of the person they work for. With respect to each document produced, identify the number of the data request and question number that the document is responding to.

These data requests do not-supersede or excuse any pending oral data requests to the respondent unless that is expressly stated in the written data request.

Identify the person providing the answer to each data request and his/her contact information. Responses should be provided both in the original electronic format, if available, and in hard copy. (If available in Word format, send the Word document and do not send the information as a PDF file.) All electronic documents submitted in response to this data request should be in readable, downloadable, printable, and searchable formats, unless use of such formats is infeasible. Each page should be numbered. If any of your answers refer to or reflect calculations, provide a copy of the supporting electronic files that were used to derive such calculations, such as Excel-compatible spreadsheets or computer programs, with data and formulas intact and functioning. Documents produced in response to the data requests should be Bates-numbered, and indexed if voluminous. Responses to data requests that refer to or incorporate documents should identify the particular documents referenced by Bates-numbers or Bates-range.

If a request, definition, or an instruction, is unclear, notify SED as soon as possible. In any event, answer the request to the fullest extent possible, specifying the reason for your inability to answer the remaining portion of the Data Request.

In answering these data requests, the respondent should adhere to the Commission's Rules of Practice and Procedure (Rules), with particular attention to Rule 1.1 of those Rules, which requires the respondent to "never mislead the Commission or its staff by an artifice or false statement of law of fact." The respondent should keep in mind that "Violations of Rule 1.1 can occur by a failure to correctly cite a proposition of law, *a lack of candor*, withholding information, providing incorrect information, or a failure to correct mistaken information."[1] SED expects the respondent to respond to these data requests with the highest level of candor.

DEFINITIONS

Unless the request indicates otherwise, the following definitions are applicable in providing the requested information.

1. The terms "document," "documents," or "documentary material" include, without limitation, the following items, whether in electronic form, printed, recorded, or written or reproduced by hand: reports, studies, statistics, projections, forecasts, decisions, and orders, intra-office and interoffice communications, correspondence, memoranda, financial data, summaries or records of conversations or interviews, statements, returns, diaries, calendars, work papers, graphs, notebooks, notes, charts, computations, plans, drawings, sketches, computer printouts, summaries of records of meetings or conferences, summaries or reports of investigations or negotiations, opinions or reports of consultants, photographs, bulletins, records or representations or publications of any kind (including microfilm, videotape, and records however produced or reproduced), electronic or mechanical or electrical records of any kind (including, without limitation, tapes, tape cassettes, discs, emails, and records) other data compilations (including without limitation, input/output files, source codes, object codes, program documentation, computer programs, computer printouts, cards, tapes, discs and recordings used in automated data processing, together with the programming instructions and other material necessary to translate, understand, or use the same), and other documents or tangible things of whatever description which constitute or contain information within the scope of these data requests.

2. "Relating to" means concerning, addressing, referring, discussing, commenting upon, analyzing, mentioning or involving in any way.

3. "Identify":

[1] Administrative Law Judge's Ruling Denying Southern California Edison Company's Motion For Summary Adjudication Of Alleged Rule 1.1 Violations Related To Data Request Responses Dated December 10, 2010, I.09-01-018, January 10, 2012, p. 6.

a. When used in reference to a person includes stating his or her full name, his or her most recent known business address and telephone number, and his or her present title or position;

b. When used in reference to documents includes stating the nature of the document (e.g., letter, memorandum), the date (if any), the title of the document, the identity of the author and/or the document, the location of the document, the identity of the person having possession, control or custody of the document, and the general subject matter of the document.

4. "CPUC" as used herein refers to the California Public Utilities Commission.

5. "SED" as used herein refers to the Safety and Enforcement Division.

6. "SCG" or "SoCalGas" as used herein refers to the Southern California Gas Company and/or its affiliates.

7. SS25 refers to the Aliso Canyon Well that leaked on October 23rd, 2015.

8. Well kill plan number 1 means a written document from Boots and Coots describing the steps that Boots and Coots took in order to do their first well kill attempt on SS25.

9. Well kill plan number 2 means a written document from Boots and Coots describing the steps that Boots and Coots took in order to do their second well kill attempt on SS25.

10. Well kill plan number 3 means a written document from Boots and Coots describing the steps that Boots and Coots took in order to do their third well kill attempt on SS25.

11. Well kill plan number 4 means a written document from Boots and Coots describing the steps that Boots and Coots took in order to do their fourth well kill attempt on SS25.

12. Well kill plan number 5 means a written document from Boots and Coots describing the steps that Boots and Coots took in order to do their fifth well kill attempt on SS25.

13. Well kill plan number 6 means a written document from Boots and Coots describing the steps that Boots and Coots took in order to do their sixth well kill attempt on SS25.

14. Well kill attempt refers to the action to carry out each well kill plan, as well as any other actions that were part of an attempt to seal well SS25 after October 23rd, 2015 .

15. Communications includes, but is not limited to, emails, texts, letters, memorandums, plans, calculations, etc.

Data Requests:

1. Please provide resumes/c.v. for the following individuals
   Brett Lane
   Todd Van De Putte
   Tom Egbert
   Roger Schweke
   Jimmy Cho

2. Of those individuals identified in response to question 1, please explain their roles related to the SS25 well leak on October 23rd, 2015.

3. Please provide any and all contracts between Southern California Gas Company ("SoCalGas") and Boots and Coots for the years 2010-2018.

4. Of those contracts between SoCalGas and Boots and Coots provided in response to question 2, please specify which contracts with Boots and Coots were related to the leak on Aliso Canyon well SS 25.

5. Of those contracts between SoCalGas and Boots and Coots provided in response to question 2, please specify which contracts are related to:
   a. The first well kill attempt of Aliso well SS25 with Boots and Coots;
   b. The second well kill attempt of Aliso well SS25 with Boots and Coots;
   c. The third well kill attempt of Aliso well SS25 with Boots and Coots;
   d. The fourth well kill attempt of Aliso well SS25 with Boots and Coots;
   e. The fifth well kill attempt of Aliso well SS25 with Boots and Coots;
   f. The sixth well kill attempt of Aliso well SS25 with Boots and Coots;

6. Please provide any employees that were involved from Boots and Coots in the following:
   a. First well kill attempt;
   b. Second well kill attempt;
   c. Third well kill attempt;
   d. Fourth well kill attempt;
   e. Fifth well kill attempt;
   f. Sixth well kill attempt.

7. Please provide Well kill plans, 1, 2, 3, 4, 5, and 6.

8. It is SED's understanding that these well kill plans referenced in question 7 are also referred to as "sheets". Please confirm SED's understanding is accurate.

9. Please provide any deviations that occurred from the well kill plans provided in response to Question 7.

10. Please provide any and all communications relating to Aliso Canyon between SoCalGas and Boots and Coots for the time period October 1, 2015 – January 31, 2018.

11. Please provide any and all contracts between SoCalGas and Don Shackleford for the years 2010-2018.

    Of those contracts between SoCalGas and Don Shackleford provided in response, were any of those related to, or used for Mr. Shackleford's services on the leak on Aliso Canyon well SS 25. If so, please specify which ones.

12. Please provide any and all communications relating to Aliso Canyon between SoCalGas and Don Shackleford for the time period October 1, 2015 – January 31, 2018.

13. When did SCG implement STIMP?

14. Why did SCG implement STIMP?

15. Who was the driver of STIMP (SME and responsible manager in charge)

16. With regards to the well-kill attempts, what data did SCG (or its agents) provide to the National Labs? Did SCG provide the Labs with any other data relating to the Aliso leak? Was any information received back? If so, please provide copies.

17. What was Halliburton's role at Aliso Canyon (during the well-kill attempts)?

18. Provide a list of all Boots and Coots personnel who were present for any amount of time at Aliso between October 2015 and January 2018; please include job descriptions, titles, and the dates when each individual was present.

19. Provide any contractors, subcontractors, or other personnel hired by SoCalGas who were involved in the operations of the leak response and subsequent kill operations, and also present at Aliso for the dates mentioned in question 18; please include job descriptions, titles, and the dates when each individual was present.

20. Provide a list of all Haliburton personnel who were present for any amount of time at Aliso between October 2015 and January 2018; please include job descriptions, titles, and the dates when each individual was present.

Name

First SS-25 Well File provided to SED

Scanned File # Date Description

AC_CPUC_0000001.File.Folder SS25A - RP
AC_CPUC_0000002.2006.SS25A.History
AC_CPUC_0000003.2006.SS25A.
AC_CPUC_0000004.2006.SS25A.Neutron Log Invoice
AC_CPUC_0000005.1994.SS25A.well.sketch
AC_CPUC_0000006.2006.SS25A.Slumberger.perforations
AC_CPUC_0000007.1993.SS25A.Tubing.Detail
AC_CPUC_0000009.1994.SS25A.Wellhead.Description
AC_CPUC_0000010.1984.SS25A.Wellhead.Sketch
AC_CPUC_0000011.2006.SS25A.logging.invoice

These files are for SS-25A and belong in the SS-25 Well File that follows the SS-25 well file below

AC_CPUC_0000012.File.Folder.SS25B - RP
AC_CPUC_0000013.2006.SS25B.History
AC_CPUC_0000014.2006.SS25B Schlumberger.time
AC_CPUC_0000015.2006.SS25B.Neutron.log.invoive
AC_CPUC_0000016.2006.SS25B.Schlumberger.invoice
AC_CPUC_0000018.1987.IW77.well.Sketch
AC_CPUC_0000019.1987.IW77.tubing details
AC_CPUC_0000020.1986.IW77-SS25B. wellhead
AC_CPUC_0000021.1986.IW77-SS25B.wellhead.skecth
AC_CPUC_0000022.2006.SS25B.log.invoice

These files are for SS-25B and belong in the SS-25B Well file that follows the SS-25A Well file below the SS-25 files

SS-25 Well File begins here

AC_CPUC_0000023.Well File Folder SS25 Well History File

1st Well History Folder — SS-25

AC_CPUC_0000024.1976.SS25A.Notice.of.Intent.to.Rework.Well
AC_CPUC_0000025.1973.SS25.History
AC_CPUC_0000029.1976.SS25.History
AC_CPUC_0000031.1979.SS25.History
AC_CPUC_0000034.1954.SS25.Tidewater.History
AC_CPUC_0000040.1954.SS25.DOGGR Well.Summary.Report
AC_CPUC_0000042.2015.Nov.10.SS25.Report.on.Operations to DOGGR

(no particular order)

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AC_CPUC_0000043.1979.SS25.Well.Sketch
AC_CPUC_0000044.1976.SS25.Tubing.Details
AC_CPUC_0000045.1972.SS25.Well.Notes
AC_CPUC_0000046.no.date.SS25.Drillsite
AC_CPUC_0000048.1973.SS25.Formation.Testing

AC_CPUC_0000056.1991.SS25.Daily.Well.Activities
AC_CPUC_0000057.1990.SS25.Daily.Well.Activities
AC_CPUC_0000058.1990.SS25.Daily.Well.Activities
AC_CPUC_0000062.1976.SS25.Interoffice.Correspondence
AC_CPUC_0000063.1988.SS25.Memo.Candidate.Wells.For.Casing.Inspection
AC_CPUC_0000064.1988.SS25.Memo.Candidate.Wells.For.Casing.Inspection
AC_CPUC_0000065.1988.SS25.Atch.to.memo
AC_CPUC_0000067.1986.SS25.Well.Sketch
AC_CPUC_0000068.1981.SS25.Wellhead.Description
AC_CPUC_0000070.1979.SS25.Work.Order.Replace SSSV.
AC_CPUC_0000071.1978.SS25.Interoffice.memo.SSSV.failure
AC_CPUC_0000072.1978.SS25.SSSV.repair.schedule
AC_CPUC_0000073.1978.SS25.SSSV.Repair.Well.Rework
AC_CPUC_0000074.1979.SS25.Well.Program.SSSV
AC_CPUC_0000075.1979.SS25.Workover.Program
AC_CPUC_0000078.1979.SS25.Repair List
AC_CPUC_0000080.1979.SS25.RigWorkSummary
AC_CPUC_0000083.1979.SS25.History
AC_CPUC_0000085.1976.SS25.History
AC_CPUC_0000088.1976.SS25.Notice.to.DOGGR.rework
AC_CPUC_0000089.1973.SS25.History
AC_CPUC_0000092.File Folder.SS25.Well.History.File — 2nd Well History folder
AC_CPUC_0000093.1964.SS25.Well.Sketch
AC_CPUC_0000094.no.date.SS25.formation.report — (no particular order)
AC_CPUC_0000096.1973.SS25.Fluid.Sample.Data
AC_CPUC_0000097.nodate.no.well.number.Pressure-Temp.Report
AC_CPUC_0000098.no.date.drill.assembly
AC_CPUC_0000099.no.date.NOMENCLATURE
AC_CPUC_0000100.2015.Oct.24.SS25.Well.Pressures ← 2015 INCIDENT
AC_CPUC_0000101.2015.Oct.SS25.Sketch.of.leak ← 2015 INCIDENT
AC_CPUC_0000102.1997.Daily.SS25.Well.Activities
AC_CPUC_0000103.1993.Daily.SS25.Well.Activities
AC_CPUC_0000104.1983.SS25.Daily.Well.Activities

AC_CPUC_0000105.1981.SS25.Daily.Well.Activities
AC_CPUC_0000106.1980.SS25.Well.Activity.Report
AC_CPUC_0000108.1986.SS25.Sub-Surface.Pressure.Survey
AC_CPUC_0000109.1983.SS25.Subsurface.Gas.Flow.diagram
AC_CPUC_0000113.1983.SS25.Baker.Tanks.Invoice
AC_CPUC_0000114.1983.SS25.Noise.Log.Report ← This should be in the Survey folder
AC_CPUC_0000115.1979.SS25.Memo.SSSV.Repair
AC_CPUC_0000116.1979.SS25.Workover.Program
AC_CPUC_0000119.1979,SS25.Well.Sketch
AC_CPUC_0000120.1976.SS25.Tubing.Detail
AC_CPUC_0000121.1979.SS25.Replacement.Parts
AC_CPUC_0000123.1979.SS25.RigWork.Summary
AC_CPUC_0000126.1979.SS25.Rigwork.Summary
AC_CPUC_0000129.1976.SS25.Work.Summary
AC_CPUC_0000130.1979.SS25.History
AC_CPUC_0000132.1979.SS25.Camco.Invoice
AC_CPUC_0000133.1979.SS25.Camco.Invoice
AC_CPUC_0000134.1978.SS25.memo.SSSSV.failure
AC_CPUC_0000135.1976.SS25.History

1970's & 1980's files are mostly related to failed Safety valves and replacements

AC_CPUC_0000137.1976.SS25.Report.on.Proposed.Operations
AC_CPUC_0000138.1976.SS25.Notice.to.DOGGR.rework
AC_CPUC_0000139.1973.SS25.History Note: SS25 was converted to gas Storage well in 1973
AC_CPUC_0000142.1973.SS25.Report.on.Proposed.Operations
AC_CPUC_0000143.1973.SS25.Notice.to.Deepen,Redrill,Alter.Casing
AC_CPUC_0000144.1968.SS25.Well.construction.Notes
AC_CPUC_0000145.1954.SS25.Orig.Completion.notes
AC_CPUC_0000146.1968.SS25.Sketch
AC_CPUC_0000147.1954.SS25.Well.Summary.Report
AC_CPUC_0000148.1954.SS25.Log.&.Core.Record
AC_CPUC_0000151.1954.SS25.History.w.Notes
AC_CPUC_0000158.1954.SS25.Report.on.test.of.Water.Shut-off
AC_CPUC_0000159.1954.SS25.Report.on.Proposed.Operations
AC_CPUC_0000160.1954.SS25.Supplementary.Notice

AC_CPUC_0000161.1953.SS25.SpecialReport.on.Operations.Witnessed
AC_CPUC_0000162.1953.SS25.Report.on.Proposed.Operations
AC_CPUC_0000163.1953.SS25.Notice.of.Intention.to.Dril.New.Well
AC_CPUC_0000164.2001.SS25.Well.Performance.Analysis
AC_CPUC_0000165.2001.SS25.Well.Performance.Analysis
AC_CPUC_0000166.2001.SS25.email.West.Field.BP.Reduction
AC_CPUC_0000167.2001.SS25.Sand.Test.History
AC_CPUC_0000168.2001.SS25.Performance.Graph
AC_CPUC_0000169.2001.SS25.Performance FlowRates
AC_CPUC_0000170.File.Folder.SS25.Well.Log.File ← 1st Well Log File folder
AC_CPUC_0000171.1984.SS25.Noise-Temp.log
AC_CPUC_0000172.1991.SS25.Noise-Temp.log
AC_CPUC_0000173.2006.SS25.Audio.Detection.Survey
AC_CPUC_0000174.1953.SS25.Schlumberger.Electrical.Log
AC_CPUC_0000175.1953.SS25.Schlumberger.Electrical.Log
AC_CPUC_0000176.1978.SS25.Audio.analyzer.survey
AC_CPUC_0000177.1978.SS25.Audio.analyzer.survey
AC_CPUC_0000178.1984.SS25.noise-Temp.Survey
AC_CPUC_0000179.1978.SS25.Temp.Survey
AC_CPUC_0000180.1973.SS25.Cement.Bond.Log.7600-8700ft
AC_CPUC_0000181.1973.SS25.Densilog.8000-8500ft
AC_CPUC_0000182.1973.SS25.Acoustilog.8000-8600ft
AC_CPUC_0000183.1973.SS25.Neutron.Lifetime.Log.8000-8600ft
AC_CPUC_0000184.1953.SS25.Electrical.Log
AC_CPUC_0000185.1954.SS25.Electrical.Log
AC_CPUC_0000186.2012.SS25.Audio.Detection.Survey — Noise Survey
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AC_CPUC_0000188.2012.SS25.Audio.Detection.Survey — Noise Survey
AC_CPUC_0000189.1973.SS25.Cement.Bond.Log.7000-8700ft
AC_CPUC_0000190.1973.SS25.Densilog.8000-8600ft
AC_CPUC_0000191.1973.SS25.Acoustilog.8000-8600ft
AC_CPUC_0000192.1973.SS25.Neutron.Lifetime.Log.8000-8600Ft
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AC_CPUC_0000194.1978.SS25.Audio.Analyzer.Survey
AC_CPUC_0000195.1984.SS25.Flo-Log. - no log
AC_CPUC_0000196.1984.SS25.Flo-log.check for leak above shoe
AC_CPUC_0000197.1984.SS25.Flo-log.tracer
AC_CPUC_0000198.1984.SS25.Flo-log.graphs
AC_CPUC_0000199.1984.SS25.Flo-log.graphs.w.notes
AC_CPUC_0000200.1984.SS25.Flo-log.graphs.w.notes
AC_CPUC_0000201.1984.SS25.Flo-log.graphs.w.notes
AC_CPUC_0000202.1984.SS25.Flo-log.gamma.Background
AC_CPUC_0000203.1984.SS25.Flo-Log.Capacitor
AC_CPUC_0000204.File.Folder.SS25.Well.Survey.File 1st Well Survey Folder
AC_CPUC_0000205.2014.SS25.Pressure.Survey
AC_CPUC_0000207.2013.SS25.Pressure.Survey
AC_CPUC_0000208.2012.SS25.Pressure.Survey These files are in chronological order
AC_CPUC_0000209.2011.SS25.Pressure.Survey
AC_CPUC_0000210.2010.SS25.Pressure.Survey
AC_CPUC_0000211.2009.SS25.Pressure.Survey
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AC_CPUC_0000213.2006.SS25.Pressure.Survey
AC_CPUC_0000214.2005.SS25.Pressure.Survey
AC_CPUC_0000215.1995.SS25.Pressure.Survey
AC_CPUC_0000218.1988.SS25.Pressure.Survey
AC_CPUC_0000220.1986.SS25.Pressure.Survey
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AC_CPUC_0000224.1985.SS25.Pressure.Survey
AC_CPUC_0000225.1984.SS25.Pressure.Survey
AC_CPUC_0000228.1983.SS25.Pressure.Survey
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AC_CPUC_0000232.1983.SS25.Pressure.Survey
AC_CPUC_0000234.1983.SS25.Pressure.Survey
AC_CPUC_0000236.1983.SS25.Pressure.Survey
AC_CPUC_0000237.1983.SS25.Pressure.Survey
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AC_CPUC_0000239.1982.SS25.Pressure.Survey
AC_CPUC_0000240.1982.SS25.Sonic.Fluid.Level.testing
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AC_CPUC_0000242.1982.SS25.Sonic.Fluid.Level.testing
AC_CPUC_0000243.1980.SS25.Pressure.Survey
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AC_CPUC_0000245.1980.SS25.Pressure.Survey
AC_CPUC_0000246.1979.SS25.Pressure.Survey.3600psi
AC_CPUC_0000249.1979.SS25.Pressure.Survey
AC_CPUC_0000252.1979.SS25.Pressure.Survey
AC_CPUC_0000255.1979.SS25.Pressure.Survey.3600+
AC_CPUC_0000256.1979.SS25.Pressure.Survey
AC_CPUC_0000257.1975.SS25.Pressure.Survey
AC_CPUC_0000259.1975.SS25.Pressure.Survey
AC_CPUC_0000260.1975.SS25.Pressure.Survey
AC_CPUC_0000262.1975.SS25.Temp.Survey
AC_CPUC_0000263.1974.SS25.Presssure.Survey
AC_CPUC_0000264.1974.SS25.Pressure.Survey
AC_CPUC_0000265.1974.SS25.Pressure.Survey
AC_CPUC_0000266.1974.SS25.Pressure.Survey
AC_CPUC_0000267.1974.SS25.Pressure.Survey
AC_CPUC_0000268.2014.SS25.Temp.Survey
AC_CPUC_0000269.2013.SS25.Temp.Survey
AC_CPUC_0000270.2012.SS25.Temp.Survey
AC_CPUC_0000271.2011.SS25.Temp.Survey
AC_CPUC_0000272.2010.SS25.Temp.Survey
AC_CPUC_0000273.2009.SS25.Temp.Survey
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AC_CPUC_0000275.2006.SS25.Temp.Survey
AC_CPUC_0000276.2005.SS25.Temp.Survey
AC_CPUC_0000277.2004.SS25.Temp.Survey
AC_CPUC_0000278.2003.SS25.Temp.Survey
AC_CPUC_0000279.2002.SS25.Temp.Survey

AC_CPUC_0000280.2001.SS25.Temp.Survey
AC_CPUC_0000281.2000.SS25.Temp.Survey
AC_CPUC_0000282.1999.SS25.Temp.Survey
AC_CPUC_0000283.1998.SS25.Temp.Survey
AC_CPUC_0000284.1997.SS25.Temp.Survey
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AC_CPUC_0000294.1995.SS25.Temp.Survey
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AC_CPUC_0000310.1993.SS25.Temp.Survey
AC_CPUC_0000314.1992.SS25.Temp.Survey
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AC_CPUC_0000325.1991.SS25.Temp.Survey
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AC_CPUC_0000334.1990.SS25.Temp.Survey
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AC_CPUC_0000364.1986.SS25.Temp.Survey
AC_CPUC_0000368.1986.SS25.Temp.Survey
AC_CPUC_0000372.1985.SS25.Temp.Survey
AC_CPUC_0000376.1985.SS25.Temp.Survey
AC_CPUC_0000379.1985.SS25.Temp.Survey
AC_CPUC_0000383.1984.SS25.Temp.Survey
AC_CPUC_0000387.1984.SS25.Temp.Survey
AC_CPUC_0000390.1984.SS25.Temp.Survey
AC_CPUC_0000393.1984.SS25.Temp.Survey
AC_CPUC_0000397.1983.SS25.Temp.Survey

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AC_CPUC_0000401.1983.SS25.Temp.Survey
AC_CPUC_0000405.1983.SS25.Temp.Survey
AC_CPUC_0000407.1982.SS25.Temp.Survey
AC_CPUC_0000410.1982.SS25.Temp.Survey
AC_CPUC_0000414.1981.SS25.Temp.Survey
AC_CPUC_0000418.1981.SS25.Temp.Survey
AC_CPUC_0000422.1980.SS25.Temp.Survey
AC_CPUC_0000426.1980.SS25.Temp.Survey
AC_CPUC_0000430.1979.SS25.Temp.Survey
AC_CPUC_0000434.1979.SS25.Temp.Survey.Replot
AC_CPUC_0000437.1979.SS25.Temp.Survey
AC_CPUC_0000438.1979.SS25.Temp.Survey
AC_CPUC_0000439.1978.SS25.Temp.Survey
AC_CPUC_0000442.1978.SS25.Temp.Survey
AC_CPUC_0000445.1977.SS25.Temp.Survey
AC_CPUC_0000448.1977.SS25.Temp.Survey.Replot
AC_CPUC_0000452.1976.SS25.Temp.Survey
AC_CPUC_0000453.1974.SS25.Temp.Survey
AC_CPUC_0000454.2006.SS25.Temp-Audio.Detection.Survey
AC_CPUC_0000455.2006.SS25.Temp-Audio.Detection.Survey
AC_CPUC_0000456.File.Folder.SS25.Well.Survey.File
AC_CPUC_0000457.1995.SS25.Pressure.Survey
AC_CPUC_0000459.1983.SS25.Pressure.Survey
AC_CPUC_0000461.1983.SS25.Pressure.Survey
AC_CPUC_0000463.1980.SS25.Pressure.Survey
AC_CPUC_0000464.1980.SS25.Pressure.Survey
AC_CPUC_0000465.1980.SS25.Pressure.Survey
AC_CPUC_0000466.1979.SS25.Pressure.Survey.3581Psi
AC_CPUC_0000468.1979.SS25.Pressure.Survey.3595
AC_CPUC_0000470.1979.SS25.Pressure.Survey.3628
AC_CPUC_0000472.1979.SS25.Pressure.Survey.3658
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AC_CPUC_0000474.1975.SS25.Pressure.Survey

2nd Well Survey Folder
↓
Some of these files are duplicates of those in 1st Survey folder
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AC_CPUC_0000475.1975.SS25.Pressure.Survey
AC_CPUC_0000476.1975.SS25.Pressure.Survey
AC_CPUC_0000477.1975.SS25.Pressure.Survey
AC_CPUC_0000478.1975.SS25.Pressure.Survey
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AC_CPUC_0000486.1974.SS25.Pressure.Survey
AC_CPUC_0000487.1973.SS25.History.page3.Tubing.Details
AC_CPUC_0000488.1974.SS25.Pressure.Survey
AC_CPUC_0000489.1974.SS25.Pressure.Survey
AC_CPUC_0000490.1976.SS25.Temp.Survey
AC_CPUC_0000491.1991.SS25.Temp.Survey.detail-cooling
AC_CPUC_0000492.1991.SS25.Temp.Survey.cooling
AC_CPUC_0000493.1991.SS25.Temp.Survey.cooling
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AC_CPUC_0000495.1990.SS25.Temp.Survey
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AC_CPUC_0000497.1989.SS25.Temp.Survey.Anomaly
AC_CPUC_0000498.1988.SS25.Temp.Survey.Shoe.Leak
AC_CPUC_0000499.1988.SS25.Temp.Survey.Anomaly.above.shoe
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AC_CPUC_0000501.1987.SS25.Temp.Survey
AC_CPUC_0000502.1987.SS25.Temp.Survey.Anomaly above S-1
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AC_CPUC_0000505.1985.SS25.Temp.Survey.Anomoly above shoe
AC_CPUC_0000506.1984.SS25.Temp.Survey.Cooling above Shoe.Tracer &Noise small leak
AC_CPUC_0000507.1984.SS25.Temp.Survey
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AC_CPUC_0000509.1984.SS25.Temp.Survey.Detail.Cooling
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AC_CPUC_0000511.1983.SS25.Temp.Survey
AC_CPUC_0000512.1982.SS25.Temp.Survey
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AC_CPUC_0000514.1981.SS25.Temp.Survey.cooling
AC_CPUC_0000515.1981.SS25.Temp.Survey
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AC_CPUC_0000518.1979.SS25.Temp.Survey.refersTO.Noise.log
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AC_CPUC_0000525.1977.SS25.Temp.Survey
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AC_CPUC_0000527.1974.SS25.Temp.Survey
AC_CPUC_0000528.File.Folder.SS25.Well.Test.File
AC_CPUC_0000529.no.date.WirelineTickets.Label
AC_CPUC_0000530.2014.SS25.Well.Analysis.Invoice
AC_CPUC_0000531.2014.SS25.Well.Analysis.Invoice
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AC_CPUC_0000609.1980.hung.up.Jarred.Through.3590ft
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AC_CPUC_0000636.1978
AC_CPUC_0000637.1978
AC_CPUC_0000638.1978
AC_CPUC_0000639.1978
AC_CPUC_0000640.1978
AC_CPUC_0000641.1978
AC_CPUC_0000642.1978
AC_CPUC_0000643.1978
AC_CPUC_0000644.1978

note: These invoices are associated with replacement of Safety Valves. Apparently, it was difficult to get the equipment down the well casing.

More invoices

Name

AC_CPUC_0000645.1978
AC_CPUC_0000646.1978
AC_CPUC_0000647.1978
AC_CPUC_0000648.no.date
AC_CPUC_0000649.1977
AC_CPUC_0000650.1977
AC_CPUC_0000651.1977
AC_CPUC_0000652.1977
AC_CPUC_0000653.1977
AC_CPUC_0000654.1977
AC_CPUC_0000655.1977
AC_CPUC_0000656.1977
AC_CPUC_0000657.1977
AC_CPUC_0000658.1977
AC_CPUC_0000659.1976
AC_CPUC_0000660.1976
AC_CPUC_0000661.1976
AC_CPUC_0000662.1975
AC_CPUC_0000663.1975
AC_CPUC_0000664.1975
AC_CPUC_0000665.1974
AC_CPUC_0000666.1973
AC_CPUC_0000667.1973
AC_CPUC_0000668.1973
AC_CPUC_0000669.1973
AC_CPUC_0000670FileFolder.SS25.Well.Test.File
AC_CPUC_0000671.no.date.SS-25.gas.production
AC_CPUC_0000672.1978.SS25.gas.production
AC_CPUC_0000673.1973.SS25.pressure.test
AC_CPUC_0000674.1973.SS25.pressure.test
AC_CPUC_0000675.1984-85.SS25.Erosion.data
AC_CPUC_0000676.2000-2001.SS25.Erosion.data
AC_CPUC_0000677.1982.erosion.data

More invoices

2nd Well Test folder

SED SUR REPLY_002722

Name

AC_CPUC_0000678.1978.erosion.data
AC_CPUC_0000679.1978.erosion.data
AC_CPUC_0000680.no.date..SS25.Choke&Pressure.Worksheet
AC_CPUC_0000683.no.date..SS25.Choke&Pressure.Worksheet
AC_CPUC_0000685.no.date.SS25.gas.production.graph
AC_CPUC_0000686.1985.erosion.data
AC_CPUC_0000687.no.date.SS25.Model.input-output.Nodal.Analysis
AC_CPUC_0000689.no.date.SS25.Model.input-output.Nodal.Analysis
AC_CPUC_0000691.no.date.SS25.Model.input-output.Nodal.Analysis
AC_CPUC_0000693.1978-2001.SS-25.Well.Data
AC_CPUC_0000694.1978.SS25.Wellhead.Performance.Curve ← 1978
AC_CPUC_0000695.2001.SS25.C.factor.v.time.graph ← 2001
AC_CPUC_0000696.1985.SS25.Sand.Test.Model.results ← 1985
AC_CPUC_0000697.1985.SS25.choke.pressures
AC_CPUC_0000698.1985.SS25.choke.pressures
AC_CPUC_0000699.1984.SS25.choke.pressures
AC_CPUC_0000700.1984.SS25.choke.pressures
AC_CPUC_0000701.1984.SS25.choke.pressures
AC_CPUC_0000702.1984.SS25.choke.pressures
AC_CPUC_0000703.1984.SS25.choke.pressures
AC_CPUC_0000704.1984.SS25.choke.pressures
AC_CPUC_0000705.1982.SS25.choke.pressures
AC_CPUC_0000706.1982.SS25.choke.pressures
AC_CPUC_0000707.1982.SS25.choke.pressures
AC_CPUC_0000708.1982.SS25.choke.pressures
AC_CPUC_0000709.1982SS25.choke.pressures
AC_CPUC_0000710.1981.SS25.choke.pressures
AC_CPUC_0000711.1978.SS25.erosion
AC_CPUC_0000714.1978.SS25.APIG.determination
AC_CPUC_0000716.1977.SS25.casing.flow
AC_CPUC_0000718.1978.SS25.casing.flow
AC_CPUC_0000720.1978.SS25.casing.flow
AC_CPUC_0000722.1978.SS25.casing.flow

AC_CPUC_0000724.1978.SS25.casing.flow
AC_CPUC_0000726.1978.SS25.casing.flow
AC_CPUC_0000728.1978.SS25.Pressure&Temp.survey.3464 psig
AC_CPUC_0000729.1978.SS25.casing.flow
AC_CPUC_0000731.1978.SS25.Pressure&Temp.survey
AC_CPUC_0000732.1978.SS25.casing.flow
AC_CPUC_0000734.1978.SS25.Pressure&Temp.survey
AC_CPUC_0000735.1978.SS25.Probe
AC_CPUC_0000736.1976.SS25.24hr.Flow.Test
AC_CPUC_0000737.1976.SS25.instrument.test
AC_CPUC_0000739.1976.SS-25.Instrument chart.gas.flow
AC_CPUC_0000740.File.Folder.Nov 7-8, 1975
AC_CPUC_0000741.1975.SS25.pressures,temp.gas.rate
AC_CPUC_0000742.1975.SS25.instrumentchart.gas.flow
AC_CPUC_0000743.1975.SS25.pressures.temp.gas.rate
AC_CPUC_0000744.1975.SS25.instrument.chart.gas.flow
AC_CPUC_0000745.file.folder.Oct.8, 1975
AC_CPUC_0000746.1975.SS25.Choke.Test
AC_CPUC_0000747.1975.SS25.Chart.for.Choke.Test
AC_CPUC_0000748.no.date.SS25.model.at 3500 psia
AC_CPUC_0000749.1974.SS25.Model run.flow.results
AC_CPUC_0000750.file.folder.Oct 11,1973
AC_CPUC_0000751.1973.SS25.Pressure.Test
AC_CPUC_0000753.1973.SS25.flow.Test
AC_CPUC_0000754.1973.SS25.test.flow.chart
AC_CPUC_0000755.1973.SS25.Graph
AC_CPUC_0000757.1973.SS25.test.flow.chart (highlight has no meaning)
AC_CPUC_0000758.1973.SS25.test.flow.chart
AC_CPUC_0000759.LASTRECORD.1973.SS25.Graph – END of SS-25 Well File
AC_CPUC_0000760.File.Folder.SS25A.Well.History.File SS-25A Well File
AC_CPUC_0000761.2010.SS-25A.Wellbore.Schematic
AC_CPUC_0000762 SS-25A and SS-25B Well Files were [illegible] SS-25 Well File.
AC_CPUC_0000763 (SS-25A & SS-25B are not copied here)

SED SUR REPLY 002724

Additional document referenced Chapter 3, Footnote 55.

Response to Data Request

Blade Response to SoCalGas Data Request

Prepared for:
Messrs. A. Patel and G. Healy

Purpose:
Blade response to the SoCalGas Data Request January 23, 2020.

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Date:
Feb. 14, 2020

Version:
1

Project Number:
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Version Record

Version	Issue Date	Issued As/ Type of Version	Author	Checked By	Project Leader
1	Feb. 14, 2020	Final	Blade	Blade	RMK

Version History

Version	Date	Description of Change

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SED SUR_REPLY_002729

1 Background

Southern California Gas Company (SoCalGas) issued a data request to Blade Energy Partners (Blade) on January 23, 2020.

Blade reviewed the data request and prepared responses to each part of the data requests. The SoCalGas questions are included verbatim followed by the Blade responses in Section 2.

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2 Questions and Responses

2.1 Question 1.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … [t]he lack of internal policy and regulation that required production casing wall thickness inspections … methodologies such as periodic wall thickness measurements were necessary," please respond to the following questions:

2.2 Question 1.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed in connection with internal policies requiring production casing wall thickness inspections.

2.2.1 Response 1.a.

Blade did not identify any INDUSTRY STANDARD(S) "in connection with internal policies requiring production casing wall thickness inspections".

2.3 Question 1.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 1(a) above.

2.3.1 Response 1.b.

No INDUSTRY STANDARD(S) were identified with "in connection with internal policies requiring production casing wall thickness inspections".

2.4 Question 1.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 1(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.4.1 Response 1.c.

No INDUSTRY STANDARD(S) were identified with "in connection with internal policies requiring production casing wall thickness inspections".

2.5 Question 1.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.5.1 Response 1.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.6 Question 1.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 1(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.6.1 Response 1.e.

Based on Blade's technical review, no requirements were identified in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] requiring operators to conduct wall thickness inspections in gas storage wells. This is discussed on page 202—Section 4.7 of the Blade Report.

2.7 Question 1.f.

For each LAW(S) identified in response to Request 1(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.7.1 Response 1.f.

An outcome of the RCA process was that the leak could have been prevented if a SoCalGas internal policy and regulations had been in place requiring periodic inspections to determine casing wall thickness as discussed on page 231—Section 5.3.1 and pages 237 – 238—Section 5.3.2 in the Blade Report. Periodic inspections would have allowed tracking wall thickness vs. time and provided data for assessing the pressure capacity of the production casing.

Therefore, Blade evaluated the regulations to determine if regulations were in place prior to the SS-25 leak that required production casing wall thickness inspections. Blade's assessment of the 2015 regulations is included in the Blade Report on pages 197 – 199—Section 4.6.

2.8 Question 2.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … [t]he lack of a real-time, continuous pressure monitoring system for well surveillance," please respond to the following questions:

2.9 Question 2.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed related to real-time, continuous pressure monitoring systems for well surveillance.

2.9.1 Response 2.a.

Blade did not identify any INDUSTRY STANDARD(S) "related to real-time, continuous pressure monitoring systems for well surveillance."

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2.10 Question 2.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 2(a) above.

2.10.1 Response 2.b.

No INDUSTRY STANDARD(S) were identified "related to real-time, continuous pressure monitoring systems for well surveillance."

2.11 Question 2.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 2(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.11.1 Response 2.c.

No INDUSTRY STANDARD(S) were identified "related to real-time, continuous pressure monitoring systems for well surveillance."

2.12 Question 2.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.12.1 Response 2.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.13 Question 2.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 2(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.13.1 Response 2.e.

Based on Blade's technical review, no requirements were identified in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] requiring "a real-time, continuous pressure monitoring system for well surveillance."

2.14 Question 2.f.

For each LAW(S) identified in response to Request 2(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.14.1 Response 2.f.

An outcome of the RCA process was that the lack of a real-time, continuous pressure monitoring system for well surveillance prevented an immediate identification of the SS-25 leak and accurate estimation of the gas flow rate. The SS-25 gas injection could have been stopped earlier preventing additional cooling at the leak and may have prevented the brittle failure that caused the production casing to circumferentially part resulting in the large breach in the casing. This is discussed in the Blade Report on page 230—Section 5.2.3, page 233—Section 5.3.1, and page 239—Section 5.4.

Therefore, Blade evaluated the regulations to determine if regulations were in place prior to the SS-25 leak that required "real-time, continuous pressure monitoring system for well surveillance."

2.15 Question 3.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … "[t]he lack of systemic practices of external corrosion protection for surface casing strings," please respond to the following questions:

2.16 Question 3.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed in connection with external corrosion protection for surface casing strings.

2.16.1 Response 3.a.

Blade considered the NACE Standard Practice SP0186-2007 titled "Application of Cathodic Protection of External Surfaces of Well Casings" [2] (formerly RP0186-2001).

The foreword from SP0186-2007 describes the standard as follows:

> This NACE International standard practice identifies procedures to determine the need for cathodic protection (CP) and the current requirements to achieve CP of well casings associated with oil and gas production and gas storage. It also outlines practices for the design and installation of CP systems and for their operation and maintenance.

2.17 Question 3.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 3(a) above.

2.17.1 Response 3.b.

NACE Standard SP0186-2007 can be purchased from the NACE website.

2.18 Question 3.c.

For any INDUSTRY STANDARD(S) identified in response to Request 3(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S).

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2.18.1 Response 3.c.

An outcome of the RCA process was that the lack of systematic practices of external corrosion protection for surface casing strings was one of the root causes for the release of hydrocarbons. This is discussed several places in the Blade Report including, page 99—Section 2.7.4; page 124—Section 2.10.2, page 193—Section 4.5, page 205—Section 4.7, page 233—Section 5.3.1, and page 239—Section 5.4.

Therefore, Blade considered the NACE Standard Practice SP0186-2007 and RP0186-2001 to determine whether the SP/RP criteria, applied to SS-25 conditions, would have identified a need for cathodic protection of the surface casing.

2.19 Question 3.d.

For any INDUSTRY STANDARD(S) identified in response to Request 3(a) above, describe how long before the October 23, 2015 leak they were published or otherwise made available.

2.19.1 Response 3.d.

The NACE standard RP0186 was published in 2001, and SP0186, which superseded RP0186, was published in 2007.

2.20 Question 3.e.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.20.1 Response 3.e.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.21 Question 3.f.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 3(e) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.21.1 Response 3.f.

Based on Blade's technical review, no requirements were identified for cathodic protection of surface casings in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.22 Question 3.g.

For each LAW(S) identified in response to Request 3(e) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.22.1 Response 3.g.

An outcome of the RCA process was that the lack of systematic practices of external corrosion protection for surface casing strings was one of the root causes for the release of hydrocarbons. This is discussed several places in the Blade Report including, page 99—Section 2.7.4, page 124—Section 2.10.2, page 193—Section 4.5, page 205—Section 4.7, page 233—Section 5.3.1, and page 239—Section 5.4.

Therefore, Blade considered the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] to determine any requirements "in connection with external corrosion protection for surface casing strings".

2.23 Question 4.

With regards to YOUR statement in the BLADE REPORT, at p. 5-6, that "the root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were … "[t]here was no quantitative understanding of well deliverability, although data were available, and well-established industry practices existed for such analysis," please respond to the following questions:

2.24 Question 4.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.24.1 Response 4.a.

Well deliverability analysis is a long-established and widely used practice by the petroleum industry.

Blade used the following handbooks and textbooks in conducting well deliverability analysis:

- *Production Optimization Using Nodal Analysis*, H. Dale Beggs, OGCI Publications, 1991
- *Petroleum Production Systems*, First Edition, M.J. Economides, A.D. Hill, C. Ehlig-Economides, Prentice Hall, 1994
- *Petroleum Production Systems*, Second Edition, M.J. Economides, A.D. Hill, C. Ehlig-Economides, D. Zhu, Prentice Hall, 2013

Blade used PROSPER, a commercially available software, which is widely used in the petroleum industry.

2.25 Question 4.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 4(a) above.

2.25.1 Response 4.b.

These documents are available for purchase online.

2.26 Question 4.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 4(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.26.1 Response 4.c.

An outcome of the RCA process was that the lack of understanding of the well deliverability was a root cause and affected the well-control planning as discussed in the Blade Report on pages 132 – 133—Section 3.2.1. Well gas flow rate is a key parameter used in dynamic kill modeling and in estimating the total gas leak volume.

Therefore, Blade used industry practices to establish well deliverability following the leak event.

2.27 Question 4.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.27.1 Response 4.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.28 Question 4.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 4(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.28.1 Response 4.e.

Based on Blade's technical review, no requirements were identified for well deliverability estimation in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.29 Question 4.f.

For each LAW(S) identified in response to Request 4(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.29.1 Response 4.f.

An outcome of the RCA process was that the lack of understanding of the well delivery was a root cause and affected the well-control planning as discussed in the Blade Report on pages 132 – 133—Section 3.2.1. Well gas flow rate is a key parameter used in dynamic kill modeling and in estimating the total gas leak volume.

Therefore, Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] to identify any requirements for estimating well deliverability.

2.30 Question 5.

With regards to YOUR statement in the BLADE REPORT, at p. 217, that "no failure analysis or subsequent risk assessment was done that may have led to an awareness that corrosion was a potential problem," please respond to the following questions:

2.31 Question 5.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed related to "failure analysis or subsequent risk assessment" related to gas storage well casings.

2.31.1 Response 5.a.

There are no specific standards or practices related to "failure analysis or subsequent risk assessment" related to gas storage well casings. However, Blade considered and evaluated API RP 585, *Pressure Equipment Integrity Incident Investigation* [3].

Blade considered API RP 1171 *Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs* [4] published in September 2015 that does address risk assessments for gas storage wells.

2.32 Question 5.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 5(a) above.

2.32.1 Response 5.b.

API RP 585 and API RP 1171 can be obtained from the API website.

2.33 Question 5.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 5(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.33.1 Response 5.c.

An outcome of the RCA process was that a direct cause of the release of hydrocarbons was an axial rupture due to external microbial corrosion on the 7 in. casing outside diameter caused by ground water. A root cause was the lack of a detailed follow-up investigation failure analyses, or RCA of casing leaks, parted casings, or other failure events as discussed in the Blade Report on page 237—Section 5.3.2. The lack of failure analyses and risk assessments related to corrosion are discussed on page 232—Section 5.3.1.

Therefore, Blade reviewed industry standards to establish industry practices regarding failure analysis and subsequent risk assessments.

2.34 Question 5.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.34.1 Response 5.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.35 Question 5.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 5(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.35.1 Response 5.e.

Based on Blade's technical review, no requirements were identified for failure analysis or subsequent risk assessments in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.36 Question 5.f.

For each LAW(S) identified in response to Request 5(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.36.1 Response 5.f.

An outcome of the RCA process was that a direct cause of the release of hydrocarbons was an axial rupture due to external microbial corrosion on the 7 in. casing outside diameter caused by ground water. A root cause was the lack of a detailed follow-up investigation failure analyses, or RCA of casing leaks, parted casings, or other failure events as discussed in the Blade Report on page 237—Section 5.3.2. The lack of failure analyses and risk assessments related to corrosion are discussed on page 232—Section 5.3.1.

Therefore, Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] to identify requirements regarding failure analysis and subsequent risk assessments.

2.37 Question 6.

With regards to YOUR statement in the BLADE REPORT, at p. 237, that "[t]he root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were . . . The lack of a dual mechanical barrier system in the wellbore," please respond to the following questions:

2.38 Question 6.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed regarding use of dual mechanical barrier systems in gas storage wells.

2.38.1 Response 6.a.

Blade considered API RP 1171 titled "*Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs*" [4] that was published in September 2015. However, API RP 1171 does not require dual mechanical barrier in gas storage wells.

Blade also considered ISO Technical Specification 16530-1, *Petroleum and Natural Gas Industries-Well Integrity Life Cycle Governance* [5] that does discuss the need for multiple barriers and redundancy to achieve a high level of reliability. However, ISO 16530-1 was published in 2017.

2.39 Question 6.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 6(a) above.

2.39.1 Response 6.b.

API RP 1171 is available on the API website. ISO 16530-1 is available on the ISO website.

2.40 Question 6.c.

For each of the INDUSTRY STANDARD(S) identified in response to Request 6(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S)

2.40.1 Response 6.c.

An outcome of the RCA process was that a root cause of the release of hydrocarbons was the lack of a dual mechanical barrier system, as discussed in the Blade Report on page 233—Section 5.3.1.

Therefore, Blade considered and assessed API RP 1171 and ISO 16530-1 to determine industry practices for dual barrier requirements.

2.41 Question 6.d.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.41.1 Response 6.d.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.42 Question 6.e.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 6(d) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.42.1 Response 6.e.

Based on Blade's technical review, no requirements were identified for dual mechanical barriers for gas storage wells in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

2.43 Question 6.f.

For each LAW(S) identified in response to Request 6(d) above, describe the reason(s) why BLADE evaluated the LAW(S).

2.43.1 Response 6.f.

An outcome of the RCA process was that a root cause of the release of hydrocarbons was the lack of a dual mechanical barrier system in the wellbore, as discussed in the Blade Report on page 233—Section 5.3.1.

Therefore, Blade evaluated the regulations to determine if regulations were in place prior to the SS-25 leak that required a dual mechanical barrier system for gas storage wells.

2.44 Question 7.

With regards to YOUR statement in the BLADE REPORT, at p. 238, that "[t]he root causes for the uncontrolled release of hydrocarbons for 111 days from SS-25 were . . . The lack of a well-specific well-control plan that considered transient kill modeling or well deliverability," please respond to the following questions:

2.45 Question 7.a.

Identify and describe any and all INDUSTRY STANDARD(S) that YOU considered, evaluated, or assessed related to well-specific well-control plans that consider transient kill modeling or well deliverability.

2.45.1 Response 7.a.

Although there are many references in the open literature, Blade considered the following as part of the RCA:

- API RP 1171, *Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs* [4] (published in September 2015)
- *Advanced Blowout and Well Control* [6] reference book
- *NORSOK Standard D-010 Rev 4, June 2013, Well Integrity in Drilling and Well Operations* [7]

2.46 Question 7.b.

Produce any and all DOCUMENTS related to any INDUSTRY STANDARDS identified in response to Request 7(a) above.

2.46.1 Response 7.b.

These documents are available for purchase online.

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2.47 Question 7.c.

For any INDUSTRY STANDARD(S) identified in response to Request 7(a) above, describe the reason(s) why BLADE evaluated the INDUSTRY STANDARD(S).

2.47.1 Response 7.c.

An outcome of the RCA process was that a root cause of the release of hydrocarbons was the lack of a well-specific well-control plan that considered transient kill modeling or well deliverability, as discussed in the Blade Report on page 233—Section 5.3.1.

Therefore, Blade considered API 1171, NORSOK Standard D010 and *Advanced Blowout and Well Control* book. API RP 1171 discusses industry practices for a blowout contingency plan. NORSOK Standard D010 discusses kill rate simulation. The *Advanced Blowout and Well Control* book includes a discussion on dynamic kill operations and using friction to control the bottom hole pressure to kill the well.

2.48 Question 7.d.

For any INDUSTRY STANDARD(S) identified in response to Request 7(a) above, describe how long before the October 23, 2015 leak they were published or otherwise made available.

2.48.1 Response 7.d.

API RP 1171 was issued in September 2015.

The book *Advanced Blowout and Well Control* was published in 1994.

NORSOK Standard D-010 Rev 4 was updated in June 2013.

2.49 Question 7.e.

Identify any and all LAW(S) that YOU considered, evaluated, or assessed in connection with the above statement.

2.49.1 Response 7.e.

Blade reviewed the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1] as described in the Blade Report on pages 197 – 199—Section 4.6.1.

2.50 Question 7.f.

For each LAW(S) that YOU evaluated in preparing the BLADE REPORT identified in response to Request 7(e) above, state YOUR understanding as to whether SoCalGas complied with the LAW(S).

2.50.1 Response 7.f.

Based on Blade's technical review, no requirements were identified for well-specific well-control plans that considered transient kill modeling or well deliverability in the October 2015 version of the *California Statutes and Regulations for Conservation of Oil, Gas, and Geothermal Resources* [1].

3 Nomenclature

3.1 Abbreviations and Acronyms

Term	Definition
API	American Petroleum Institute
Blade	Blade Energy Partners
ISO	International Standards Organization
NACE	National Association of Corrosion Engineers
NORSOK	Norsk Sokkels Konkurranseposisjon (a Norwegian Standards Organization)
RCA	Root Cause Analysis
SoCalGas	Southern California Gas Company

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4 References

[1] State of California, "California Statutes and Regulations for Conservation of Oil, Gas, & Geothermal Resources," 2015.

[2] NACE International, "Application of Cathodic Protection for External Surfaces of Steel Well Casings (NACE SP0186-007)," 2007.

[3] American Petroleum Institute, "API RP 585 Pressure Equipment Integrity Incident Investigation," Washington, DC, April 2014.

[4] American Petroleum Institute, "API RP 1171, Functional Integrity of Natural Gas Storage in Depleted Hydrocarbon Reservoirs and Aquifer Reservoirs," Washington, DC, September 2015.

[5] ISO, "Petroleum and natural gas industries-Well integrity-Part 1: Life cycle governance," 2017-03.

[6] R. D. Grace, Advanced Blowout and Well Control, Houston: Gulf Publishing Company, 1994.

[7] Standards Norway, "NORSOK Standard D-010, Well Integrity in Drilling and Well Operations, Rev 4," June 2013.

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