Docket:	I.19-06-016
Exhibit Number	
Commissioner	Rechtschaffen
Admin. Law Judges	Poirier/Kenney
SED Project Mgr.	
SED Witness	

SAFETY AND ENFORCEMENT DIVISION
California Public Utilities Commission

REPLY 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

SUPPORTING ATTACHMENTS

San Francisco, California
March 20, 2020

INDEX LIST OF SUPPORTING ATTACHMENTS

DESCRIPTION	BATES NUMBER
FN.06.I1906016 CPUC SED DR 47	SED_RT_0001 – SED_RT_0019
FN.14.1.SPE-1606-G-PA	SED_RT_0020 – SED_RT_0028
FN.14.2.NACE-SP0186-NN	SED_RT_0029 – SED_RT_0056
FN.16.AC_CPUC_25-28.SS-25.well.File	SED_RT_0057 – SED_RT_0060
FN.19.AC_CPUC_SED_DR_27_0000046.1989.DOGGR.Ltr	SED_RT_0061 – SED_RT_0062
FN.20.AC_CPUC_0165094.Boots&Coots.DailyReports	SED_RT_0063
FN.21.Page 2-14 from Aliso_Final_EIR_Volume_II-Appendices	SED_RT_0064
FN.22.DOGGR_Final-Text-of-Regulations-UGS	SED_RT_0065 – SED_RT_0088
FN.25.I1906016 CPUC SED DR 48	SED_RT_0089 – SED_RT_0111
FN28.Pages 564-565 from P-44 All	SED_RT_0112 – SED_RT_0113
FN.30.Boots&Coots.DailyReports	SED_RT_0114 – SED_RT_0160
FN.36.SoCalGas.Response.DR25.01.FREW.2.2014.Model.SIMP	SED_RT_0161 – SED_RT_0166
FN.42.DR11.01 SCG Leak Well List Master	SED_RT_0167 – SED_RT_0168
FN.44.AC_CPUC_0014708.SIMP.10.2016.Status	SED_RT_0169 – SED_RT_0171
FN.47.Blade-29 Amended 032219.Leaks	SED_RT_0172 – SED_RT_0173
FN.52.1.SoCalGas.Response to DR01.01 SCG	SED_RT_0174 – SED_RT_0190
FN.53.SoCalGas.Response.to.CPUC.SED.27.Q.37	SED_RT_0191 – SED_RT_0204
FN.58.I1906016_SCG_SED_DR_47_0000297	SED_RT_0205 – SED_RT_0488
FN.64.I1906016_SCG_SED_DR_47_0000093	SED_RT_0489 – SED_RT_0493
FN.65.SoCalGas.Response.to.DR29.01	SED_RT_0494 – SED_RT_0498
FN.68.SS-25 SCG-7.Temp.Noise, p.149	SED_RT_0499
FN.70.1.AC_CPUC_0000492.1991.1107.SS-25.Leak	SED_RT_0500

DESCRIPTION	BATES NUMBER
FN.70.2.SS-25 SCG-6.1991 NoiseTemp.pp.150-151	SED_RT_0501 – SED_RT_0503
FN.72.SS-25 SCG-4.2006.p.433	SED_RT_0504
FN.73.SS-25 SCG-3.p.252	SED_RT_0505
FN.76.I1906016_SCG_SED_DR_47_0000582	SED_RT_506
FN.80.1.Aliso_Canyon_DOGGR_0001897.Caliper.Tool.FF-34	SED_RT_507
FN.80.2.Aliso_Canyon_DOGGR_0001881.Corrosion1991.FF-34A	SED_RT_508
FN.83.SoCalGas.Response.to.DR33.01	SED_RT_0509 – SED_RT_0526
FN.86.EUO_BRET LANE_012418_VOL 1p.1&101-102	SED_RT_0527 – SED_RT_0529
FN.90.03-11-2019 LACDPH to SoCalGas	SED_RT_0530 – SED_RT_0531
FN.101.I1906016 SoCalGas.Response.to.CPUC.DR.45	SED_RT_0532 – SED_RT_0540

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-47 DATED NOVEMBER 27, 2019

SOCALGAS RESPONSE DATED DECEMBER 13, 2019

SoCalGas provides the following Responses to the Safety and Enforcement Division (SED) data request dated November 27, 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.

Each of the following questions ask about passages in the testimony of Dan Neville on behalf of SoCalGas in I.19-06-016.

<u>QUESTION 1:</u>
Pages 3-4 Paragraph beginning at P.3 Line 19 states in part, "… through design and systematic evaluation, testing, and monitoring of the various pressure barriers. . ." With regards to this statement:

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-47 DATED NOVEMBER 27, 2019

SOCALGAS RESPONSE DATED DECEMBER 13, 2019

a. Please confirm that the following are the only instances of the above referenced evaluations on SS-25:
    i. Pre gas storage operations cement bond log run across the cemented area of the well above the gas storage zone 8738 feet to 6950 feet.
    ii. Pre gas storage operations pressure test to 3400 psi.
    iii. Pre gas storage operations installation and testing of high-pressure gas wellhead system.

b. Pg.4-lines 4-5, states in part, "Pressure test ports are available between each set of seals so that each seal can be pressure tested independently." With regards to this statement, provide all records of pressure tests using "pressure test ports" between each set of seals that were installed on SS-25.

<u>RESPONSE 1:</u>

a. SoCalGas objects to this request as overly broad and vague to the extent it fails to specify a time to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:
    i) The referenced cement bond log was run on May 26, 1973 during the workover performed to convert the well for gas storage operations. There are no other instances of a cement bond log run in the well.
    ii) The referenced pressure test to 3400 psi occurred on May 29, 1973 during the workover performed to convert the well for gas storage operations. Additional instances of a pressure test occurred on September 9, 1976 and on February 19, 1979 during well workovers. The September 9, 1976 test was to a pressure of 2500 psi. The February 19, 1979 test was to a pressure of 1500 psi.
    iii) The referenced installation and testing of the high-pressure gas wellhead system occurred on June 1, 1973 and June 2, 1973 during the workover to convert the well for gas storage operations. Records show that a component of the wellhead called the "Christmas tree" was pressure tested on June 6, 1973, on July 8, 1976, and on February 20, 1979. An additional instance of a pressure test of the wellhead occurred on June 22, 2005.

a. Records show there were two instances of utilizing the pressure test ports to pressure test the wellhead seals, independently. The first pressure test occurred on June 2, 1973 during the workover to convert the well for gas storage. Please see September 5, 1973 document *Division of Oil & Gas – History of Oil or Gas Well* on June 2, 1973. The second instance of a pressure test occurred on June 22, 2005. 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 to AC_CPUC_12389
    AC_CPUC_0206158 - AC_CPUC_0208846

QUESTION 2:

Page 4 Lines 6-13, states,

> "As of October 22, 2015, active UGS wells at Aliso Canyon, including SS-25, were subject to a systematic well integrity monitoring and inspection program that included: (1) daily site inspections; (2) weekly pressure readings; (3) monthly well site inspections; (4) annual leakage surveys; (5) annual temperature surveys and, if needed, noise and/or tracer surveys; and (6) additional casing integrity inspections if tubing was removed in the course of a workover. Separate and apart from the scheduled inspections and tests, if a well exhibited abnormal conditions, additional testing was conducted, including unscheduled pressure readings, temperature surveys, noise surveys, gas sampling, and/or other investigative work."

With regards to this passage, please answer the following:

FOR WELL SS-25: Provide copies of all records, (including individual pages from the SS-25 well file, compiled into one searchable pdf document) showing all instances of each of the following for Well SS-25 pre-October 23, 2015. For every test and inspection identified, provide the date of the event, the name of the person who performed the inspection or test and their affiliation with

SoCalGas, where the records are kept, all audits of these records performed by SoCalGas or its contractors (including the name(s) of the auditor(s)), and the form of the records (electronic or paper):

a. Daily site inspections
b. Weekly pressure readings
c. Monthly well site inspections
d. Annual leakage surveys
e. Annual temperature surveys
f. Noise surveys
g. Tracer surveys
h. Casing integrity inspections
i. Additional unscheduled pressure readings
j. Additional unscheduled temperature surveys
k. Additional unscheduled noise surveys
l. Additional unscheduled gas sampling
m. Additional unscheduled other investigative work (explain what this is for each item identified)

RESPONSE 2:

SoCalGas object to this request as overly broad and unduly burdensome, and to the extent it fails to specify a time to which SoCalGas may tailor its response. SoCalGas further objects to this request on the grounds it is duplicative to the extent SED already is in possession of these records and assumes facts (including that audits are conducted or required). Subject to and without waiving the foregoing objections, SoCalGas responds as follows. SoCalGas interprets this request to seek information prior to October 23, 2015.

a. As a general practice, SoCalGas did not maintain records of daily site inspections. If the daily site inspection generated a corrective work order, that record is maintained in Maximo.
b: Please see previously provided electronic documents with Bates range:

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-47 DATED NOVEMBER 27, 2019

SOCALGAS RESPONSE DATED DECEMBER 13, 2019

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; 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;

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-47 DATED NOVEMBER 27, 2019

SOCALGAS RESPONSE DATED DECEMBER 13, 2019

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; 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;

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-47 DATED NOVEMBER 27, 2019

SOCALGAS RESPONSE DATED DECEMBER 13, 2019

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.

c. Please see the enclosed electronic documents with the following Bates ranges: I1906016_SCG_SED_DR_47_0000297 - I1906016_SCG_SED_DR_47_0000580.

d: Please the enclosed electronic documents with the following Bates ranges: I1906016_SCG_SED_DR_47_0000093 - I1906016_SCG_SED_DR_47_0000296.

e-h: Please see the previously provided SS-25 well file documents and/or well related with Bates ranges:

AC_CPUC_0000023 - AC_CPUC_0000759
AC_CPUC_0012338 to AC_CPUC_12389
AC_CPUC_0206158 - AC_CPUC_0208846

i: SoCalGas objects to this request to the extent it assumes additional unscheduled pressure readings to investigate the integrity of the well were performed or required. Subject to and without waving the foregoing objection, SoCalGas responds as follows: Please see Response 2b.

j. SoCalGas objects to this request to the extent it assumes additional unscheduled temperature surveys to investigate the integrity of the well were performed or required. Subject to and without waving the foregoing objection, SoCalGas responds as follows:

Please see the previously provided SS-25 well file documents and/or well related information with Bates ranges:

AC_CPUC_0000023 - AC_CPUC_0000759
AC_CPUC_0012338 to AC_CPUC_12389

AC_CPUC_0206158 - AC_CPUC_0208846

k: SoCalGas objects to this request to the extent it assumes additional unscheduled noise surveys to investigate the integrity of the well were performed or required. Subject to and without waving the foregoing objection, SoCalGas responds as follows:

Please see the previously provided SS-25 well file documents and/or well related information with Bates ranges:

AC_CPUC_0000023 - AC_CPUC_0000759
AC_CPUC_0012338 to AC_CPUC_12389
AC_CPUC_0206158 - AC_CPUC_0208846

l: SoCalGas objects to this request to the extent it assumes additional unscheduled gas sampling was performed or required. Subject to and without waving the foregoing objection, SoCalGas responds as follows. N/A

m: SoCalGas objects to this request to the extent it assumes other investigative work was performed or required. Subject to and without waving the foregoing objection, SoCalGas responds as follows:

Please see the previously provided SS-25 well file documents and/or well related information with Bates ranges:

AC_CPUC_0000023 - AC_CPUC_0000759
AC_CPUC_0012338 to AC_CPUC_12389
AC_CPUC_0206158 - AC_CPUC_0208846

QUESTION 3:

With regards to the passage on Page 4 Lines 6-13 quoted in question 2, please answer:

FOR WELL SS-25: For every instance of an abnormal condition identified in the records of inspections listed above, state how the problem was resolved and provide all records that document the resolution.

RESPONSE 3:

SoCalGas objects to this request on the ground it is duplicative to the extent SED already is in possession of these records. SoCalGas further objects to this request on the grounds it is broad, vague, ambiguous, unduly burdensome, assumes facts, or otherwise fails to describe with reasonable particularity the information sought. SoCalGas additionally objects to this request to the extent it is not limited to a specific period of time to which SoCalGas may tailor its response.

Subject to and without waiving the foregoing objections, SoCalGas responds as follows:

Please see the previously provided SS-25 well file documents and/or well related information with Bates ranges:

AC_CPUC_0000023 - AC_CPUC_0000759
AC_CPUC_0012338 to AC_CPUC_12389
AC_CPUC_0206158 - AC_CPUC_0208846

SoCalGas identified certain temperature surveys run in the 1980's as having a temperature anomaly. These anomalies were investigated with noise surveys and a tracer survey in 1984 and were found not to be indicative of a well integrity issue. Please see attached 1984 temperature surveys, noise logs and RA tracer survey. Subsequent noise logs were run in 1991, 2006, and 2012 which also did not indicate any well integrity issue.

QUESTION 4:

Pages 4- 5, paragraph beginning p.4 line 26, which states,

"Once each week, SoCalGas field operators connected a pressure gauge to instrumentation tubing at the well site to check the pressure in each tubular space within the well: (1) the interior of the tubing (tubing pressure), (2) the annular space between the tubing and the production casing (casing pressure), and (3) the annular space between the production casing and the surface casing (surface casing pressure). In a well such as SS-25 that allows for casing flow, the tubing and casing are exposed to the storage zone pressure and, as a result, the tubing, casing, and storage zone pressures are nearly equal."

With this passage in mind, please answer:

Provide all pressure gauge reading records taken BEFORE October 24, 2015 (including the day of the well failure) by field operators using a pressure gauge connected to instrumentation tubing at the SS-25 well site to check the pressure in each of the tubular spaces within the well as described in this paragraph.

RESPONSE 4:

SoCalGas objects to this request on the ground it is duplicative to the extent SED already is in possession of these records. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

Please see Response 2b and the enclosed electronic document with the following Bates ranges: I1906016_SCG_SED_DR_47_0000582.

QUESTION 5:

Page 5 lines 8-9, states,

> *"Further investigation would typically consist of checking the wellhead seals, and/or running temperature/noise surveys, and/or gas sampling."*
> With this in mind, please answer:

a. For Well SS-25, identify by date and type of investigation all "further investigations" that occurred over the life of the well.
b. For each investigation identified, provide all records related to that investigation, including results and follow up work to resolve and problems identified.

RESPONSE 5:

a. Please see Response 3.
b. SoCalGas objects to this request on the ground it is duplicative to the extent SED already is in possession of these records. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

Please see Response 3. The weekly pressure records indicate that the surface pressure readings of SS25 were not anomalous and consequently there was no reason for SoCalGas to conduct further investigations.

QUESTION 6:
Page 6 Lines 22-26, states,

> "SoCalGas used the removal of the tubing during a workover as an opportunity to perform certain kinds of integrity tests on the well's production casing that are not possible when the tubing is in place, such as running an ultrasonic inspection tool ("USIT"), which uses ultrasonic sound waves to circumferentially measure the internal radius and thickness of the casing as well as cement quality."
>
> With this in mind, please answer:
>
> > **a.** For Well SS-25, provide all records pre-October 23, 2015, that show removal of the tubing during a workover and performance of integrity tests on the well's production casing, including but not limited to ultrasonic inspection.

RESPONSE 6:

SoCalGas objects to this request on the grounds it assumes facts. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

SoCalGas conducted three workovers on SS25 in which the tubing was removed. The initial workover was performed to convert the well to gas storage, followed by two workovers related to the deep-set sub-surface safety valve. Please see Division of Oil & Gas – History of Oil or Gas Well reports dated September 5, 1973, July 29, 1976, and February 21, 1979. Please see previously provided SS-25 well file documents and/or well related information with Bates ranges:

AC_CPUC_0000023 - AC_CPUC_0000759
AC_CPUC_0012338 to AC_CPUC_12389
AC_CPUC_0206158 - AC_CPUC_0208846

QUESTION 7:
Page 6 Lines 28-30, states,

"Prior to October 23, 2015, SoCalGas successfully addressed and repaired infrequent casing leaks as they arose. SoCalGas' monitoring, inspection, and testing program successfully identified and stopped leaks." With this in mind, please answer the following:

a. For Well SS-25, identify all instances of casing leaks identified by SoCalGas, and how each leak was repaired.
b. Provide the records showing the date of each leak listed in response to question 7a.
c. Provide the records related to the each leak listed in response to question 7a.

RESPONSE 7:

a. SoCalGas had not identified any instances of casing leaks in SS25 prior to October 23, 2015.
b. Please see Response 7a.
c. Please see Response 7a.

QUESTION 8:
Page 7 Lines 12-20, states,

"As an additional safety measure, SoCalGas had in place a remote well kill system so that SoCalGas could kill the well in the event the well site was inaccessible. The system consisted of valves and piping connected to the wellhead, separate from the flow side of the wellhead, specifically to allow remote well kill. The piping ran to a remote area from the wellhead so that pumping equipment could be staged away from the immediate wellhead area, if necessary. Additionally, each well was connected to a kill network of piping so that an individual well could be killed from a nearby well. 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 passage in mind, please answer:

For Well SS-25, provide a drawing showing how the well was connected to the remote well kill system (network) as described in the passage quoted in this question.

RESPONSE 8:

Please see the enclosed electronic document with the following Bates range: I1906016_SCG_SED_DR_47_0000581.

QUESTION 9:

With regards to the passage quoted in question 8, and as shown on page 7 Lines 1220, please answer the following:

- **a.** For Well SS-25, provide records showing an instance when this system was successfully used to kill the well before October 23, 2015.
- **b.** Include operating records that documented the well conditions before, during, and after the well kill event.

RESPONSE 9:

a. The remote well kill system was not utilized to kill SS-25 prior to October 23, 2015.

b. N/A

<u>QUESTION 10:</u>
With regards to the passage quoted in question 8, and shown on page 7 Lines 12-20, please answer the following: For Well SS-25, was this system used on, or after, October 23, 2015?

a. If the response is "no," explain why not.
b. If the response is "yes," identify the dates when the system was used and for each instance identified, provide records showing plans for the well kill(s), problems encountered with the system, and how each problem identified was resolved.

<u>RESPONSE 10:</u>

a. SoCalGas objects to this request to the extent it assumes the referenced well kill system should or was required to be used on, or after, October 23, 2015. SoCalGas further objects to this request as vague and ambiguous. Subject to and without waiving the foregoing objections, SoCalGas responds as follows:

Please refer to the Prepared Opening Testimony of Mr. Schwecke. The well kill system was not utilized to remotely kill SS-25 for the first well kill attempt performed by SoCalGas since there was direct access to the SS-25 wellhead. Well kill attempts 2 –7 were performed by Boots & Coots.

b. N/A

<u>QUESTION 11:</u>
Page 7 lines 25-27 states in part, "Prior to moving the workover rig on the well, operators would remove any plugs that were set for mechanical isolation. . ."

With this in mind, please answer the following:

a. For Well SS-25 on or after October 23, 2015: Did this well have "any plugs that were set for mechanical isolation"?
b. If the response is "no," explain why not.
c. If the response is "yes," provide records that show installation of the plugs, how many were installed, and removal of the plug(s) after October 23, 2015 prior to the first well kill attempt.

RESPONSE 11:

SoCalGas objects to this request to the extent it assumes mechanical isolation was possible or appropriate. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

a. No, SS-25 did not have plugs set for mechanical isolation on or after October 23, 2015.

b. Due to the nature of the leak, it was determined that mechanical isolation was not appropriate.

c. N/A

QUESTIONS 12:

Page 7, lines 30-31 and page 8 line 1 states,

> "Following the workover, SoCalGas prepared a "History of Oil or Gas Well" report that described the daily work conducted, including detailing changes in the downhole configuration."
>
> Regarding this passage, please answer:
>
> For Well SS-25, provide copies of all of the History of Oil or Gas Well reports created after October 23, 2015.

RESPONSE 12:

Please see the enclosed electronic documents with the following Bates ranges: I1906016_SCG_SED_DR_47_0000001 - I1906016_SCG_SED_DR_47_0000092.

QUESTION 13:
Page 8, lines 1-3 state as follows:

> "In addition to this report, following the workover, SoCalGas submitted required workover records, including casing inspection logs, to DOGGR."
>
> With this in mind, please answer the following:

a. For Well SS-25. Provide copies of all workover records, including casing inspection logs, provided to DOGGR after October 23, 2015.

RESPONSE 13:

Please see the DOGGR website via the following link:

https://secure.conservation.ca.gov/WellSearch/Details?api=03700776&District=&County=&Field=&Operator=&Lease=&APINum=03700776&address=&ActiveWell=true&ActiveOp=true&Location=&sec=&twn=&rge=&bm=&PgStart=0&PgLength=10&SortCol=6&SortDir=asc&Command=Search

QUESTION 14:
Page 8, lines 4-16, state,

> "UGS wells were additionally equipped with safety systems designed to shut-in wells in order to prevent or mitigate leaks in the wellhead or surface piping.
> The surface safety system consisted of fail-close pneumatic operated valves located on the wellhead and designed to close by any of the following methods:

- Low pressure pilot – shuts in well if a break in the surface piping causes the wellhead pressure to drop below a threshold value;
- High pressure pilot – shuts in well if pressure in the surface withdrawal line exceeds a threshold value;
- Sacrificial sand erosion probe – shuts in well upon excessive erosive sand production;
- Fusible plug – shuts in well if a fire occurs in the well cellar; and
- Remote shut down station – allows for wells to be shut-in manually from a remote distance from the wellhead."

With this passage in mind, please answer the following:

For Well SS-25: Confirm that this well was equipped with safety systems designed to shut-in the well in order to prevent or mitigate leaks in the wellhead or surface piping.

a. If the response is "no," explain why not.
b. If the response is "yes," provide records of all instances where the well was shut in using this safety system and identify the method (shown in lines 8-16) for each instance the well was shut in.

RESPONSE 14:

SoCalGas objects to this request to the extent it fails to provide a time period to which SoCalGas may tailor its response. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

a. N/A
b. SoCalGas further objects to this request to the extent it assumes SS-25 was shut-in

using the referenced safety systems. Subject to and without waiving the foregoing objection, SoCalGas responds as follows:

SoCalGas interprets this request to seek information prior to October 23, 2015.

Yes. SS25 was equipped with the safety systems identified above. As a general practice, SoCalGas did not keep a record of instances when surface safety systems shut-in a well.

Use of Oxygen Scavengers To Control External Corrosion of Oil-String Casing

F. W. SCHREMP
J. F. CHITTUM
CALIFORNIA RESEARCH CORP.
LA HABRA, CALIF.

T. S. ARCZYNSKI
STANDARD OIL CO. OF CALIF.
LA HABRA, CALIF.

ABSTRACT

This paper describes a laboratory study of causes of external casing corrosion and the test work that led to the use of oxygen scavengers to prevent this attack. External casing failures are classified as water-line, casing-casing, collar and body failures. A corrosion mechanism based on principles of differential oxygen availability is developed that is consistent with facts known about each kind of failure. The field use of oxygen scavengers is depicted as a direct result of the laboratory study.

A part of the paper is devoted to reporting on the field use of hydrazine to control external casing corrosion. Results of field measurements made over a period of several years are presented as evidence of the effectiveness of the hydrazine treatment. The first conclusion reached is that the use of hydrazine materially reduces the cathodic protection requirements for treated wells. This result is interpreted to mean that a reduction is taking place in the amount of corrosion on the casing. Results indicate also that hydrazine shows its greatest usefulness within the first 12 to 18 months after a well is completed when pitting corrosion is likely to be most active.

INTRODUCTION

According to surveys sponsored by the National Association of Corrosion Engineers,[1] the cost of repairing casing leaks caused by external corrosion may exceed $4 million per year. In addition, well damage and lost production resulting from casing leaks probably costs the petroleum industry an additional $5 to $6 million per year.

Concern about the cost of external casing corrosion led to an extensive laboratory study of factors causing this external corrosion and to the development of a new approach to its prevention. This paper presents a discussion of various causes of external casing corrosion, details of laboratory studies and the results of the field use of an oxygen scavenger in well cementing fluids to prevent the external corrosion of oil-string casing.

Measurements on test wells over a period of several years show that cathodic-protection current requirements are greatly reduced when hydrazine is used in cementing mud. Reduction of current requirements can be interpreted to mean that removal of oxygen by hydrazine has greatly suppressed corrosion cells on the external surface of the casing and thereby, has reduced corrosion.

To date, hydrazine has been used by the Standard Oil Co. of California in more than 200 well completions.

KINDS OF CASING FAILURES

A survey of a large number of casing leaks disclosed four types of external casing failures — water-line, casing-casing, collar and body failures. These types are identified largely by their location on the casing. Water-line failures are found just below the surface of water or mud in the casing annulus. Casing-casing failures occur on the oil string just below the shoe of the surface string. Collar failures are found in the threaded ends of casing joints where they are screwed into casing collars. Body failures may occur at any point on the body of a casing joint. Examples of each kind of failure have some of the general characteristics that are shown in Fig. 1.

Water-line failures usually result in the circumferential severance of an oil-string casing. The corrosive action causing a water-line failure usually is sharply defined and is limited to a short length of the casing. Casing-casing failures usually are accompanied by pitting corrosion distributed around the oil-string casing for distances up to 100-ft below the shoe of the surface string. Casing-casing failures may also sever the casing. Collar failures seem to start on the first thread at the bottom of recesses between collar and casing joint. Corrosion proceeds across the threads by what appears to be a normal pitting mechanism. Both casing and collar are severely attacked. Body failures are the result of highly localized pitting at any point on a casing wall. Besides the pit that perforates a casing, a large number of other pits usually are found along one side of the casing joint. The pits occasionally are filled with corrosion products consisting largely of oxides and sulfides.[2] Frequently, the mill scale is largely intact on the rest of the casing.

Examination of a casing failure does not always reveal the cause of the failure. Frequently, the necessary details are destroyed when the failure occurs. For example, formation water flowing through a perforation at high velocity may enlarge the hole and destroy any remaining evidence of the cause of the failure. One way to obtain undistorted information about a failure is to study the nature of other pits on the casing in the vicinity of the failure. A study of such pits frequently suggests that they are characteristic of an attack resulting from the differential availability of molecular oxygen.

Original manuscript received in Society of Petroleum Engineers office Aug. 24, 1960. Revised manuscript received April 28, 1961. Paper presented at 31st Annual California Regional Meeting of SPE, Oct. 20-21, 1960, in Pasadena, Calif.

[1]References given at end of paper.

SED_RT_0020

CONDITIONS LEADING TO EACH TYPE OF CASING CORROSION

WATER-LINE ATTACK

Water-line attack is found in wells with open casing annuli. Air diffuses into the casing annulus and makes oxygen available for the cathode reaction,

$$\frac{1}{2}O_2 + H_2O + 2e^- = 2OH^- \quad . \ . \ . \ . \ . \ . \ . \ (1)$$

This reaction occurs at the fluid-air interface. Just below the interface the fluid is deficient in oxygen, but the metal lattice is exposed so metallic iron takes part in the anode reaction,

$$Fe = Fe^{++} + 2\,e^- \quad . \ . \ (2)$$

Occurrence of these reactions at the fluid-air interface will result in corrosive attack on the casing just below the fluid-air interface. Prolonged reaction at a constant interface level will result in a severed casing, as shown in Fig. 1(A).

Other chemical reactions also take place during the process of casing corrosion. These reactions, as shown by Eqs. 3 and 4, also help maintain the potential of the corrosion cell.

$$Fe^{++} + 2OH^- = Fe(OH)_2 \quad . \ (3)$$

$$3Fe(OH)_2 + \frac{1}{2}O_2 = Fe_3O_4 + 3H_2O \quad . \ . \ . \ . \ . \ . \ . \ . \ . \ . \ . \ (4)$$

Removal of ferrous ions from solution near the fluid-air interface causes the attack to continue and be concentrated near this interface, as shown in Fig. 2(A). This corrosion mechanism is identical to that first given by Evans[3,4] in formulating his principle of "differential aeration" as the cause of pitting.

CASING-CASING CORROSION

Casing-casing corrosion occurs when oil and surface casing strings are in contact with two different muds. Such an occurrence is possible when the surface string is imperfectly cemented. The difference in mud composition may be either in oxygen content or pH, or both. If the oil string is in contact with a mud of lower pH than the surface string, or with mud having a lower oxygen concentration than the surface string, the oil string will behave as an anode.

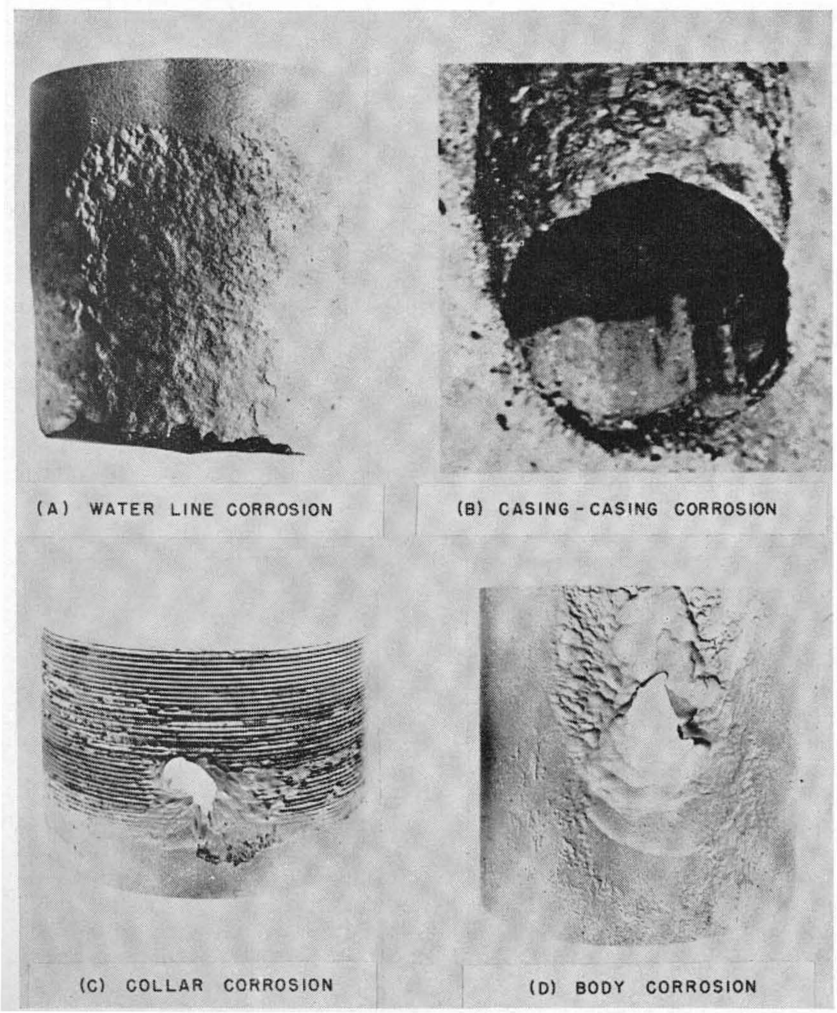


FIG. 1—EXAMPLES OF THE VARIOUS TYPES OF CASING CORROSION.

The reaction of Eq. 2 will be concentrated on the oil string near the shoe of the surface string, and iron will be removed most rapidly from the casing surface at any susceptible points on the metallic lattice. The cathode reaction of Eq. 1 will occur on the surface string. The complete corrosion cell with current lines in solution is illustrated in Fig. 2(B).

COLLAR FAILURE

Collar failure may be caused solely by improper joint make-up. The original leak in this case would be enlarged by erosion-corrosion while formation water flows through it. Improper joint make-up includes joints not torqued sufficiently to make a tight joint, and galled threads resulting from damaged threads, or failure to use lubricant.

Failure due to corrosion also may occur in the recess between the threaded portion of the casing joint and the end of the collar. The mechanism of such a failure is illustrated in Fig. 2(C). Differential availability of oxygen in the recess may set up the condition in which the anode reaction (Eq. 2) can take place on the exposed thread. The cathode reaction of Eq. 1 could occur on the mill-scale-coated casing adjacent to the recess. The potential of this cell could be maintained by the reactions of Eqs. 3 and 4. Current in this cell can be expected to produce rapid attack on the exposed threads.

BODY CORROSION

Body corrosion apparently occurs when differential conditions produce a corrosion cell along the body of a casing joint. The tendency for pitting to occur along one side of a casing joint suggests the possibility of mill-scale damage being the cause of increased corrosion susceptibility. Usually, the rest of the varnish and mill-scale coating on the surface of the joint is undamaged. Mill-scale damage of this kind along one side of a casing string can occur as the casing is run into a well. The removal of mill scale exposes the metallic lattice directly to the cementing mud. Under these conditions, the anode reaction of Eq. 2 takes place on the exposed iron. The small anode and large cathode areas cause highly localized corrosive attack.

Localized corrosive attack also may be created when formation waters free from oxygen seep into the mud and make contact with the casing at small areas. The points of contact with the formation water will be anodic to the rest of the casing. Furthermore, colonies of bacteria in a pit on a casing may localize corrosive action.[5] The metal surface covered by corrosion products from which bacteria have removed oxygen may be anodic to the surrounding casing surface. Both of these conditions will cause pitting corrosion. Two kinds of body corrosion are illustrated in Fig. 2(D).

CAUSES OF CASING CORROSION

The various kinds of casing corrosion were studied in the laboratory by devising experiments to simulate each kind of corrosion. Both potential and current measurements were made as a function of time in an effort to follow the effects of the various conditions that were changed during the study.

WATER-LINE CORROSION

A laboratory study was carried out to determine the magnitude of the potentials that could be built up to cause water-line corrosion. A water sample was collected from a casing annulus and adjusted to anaerobic conditions comparable to those in the casing annulus. Potentials (referred to saturated calomel electrode) of a small iron electrode were measured at different levels below the surface of the water sample. In the test apparatus, an iron electrode was sealed with insulating material into a hole through the wall of an iron tube so that the potentials of this electrode could be measured separately as the tube was moved up and down in the water. Atmospheres of air, nitrogen and oil-air were used successively above the water during the study. Fig. 3 shows that there was a 90-mv difference in the first 5 to 10 mm below the surface of the water sample as a result of differential oxygen concentration. Nitrogen atmosphere and the oil layer prevented the formation of the oxygen concentration cell.

A study of the current obtainable from a water-line corrosion cell and the nature of the anode was carried out in apparatus shown in Fig. 4. Six steel rods ¼-in. in diameter and 3-feet long were centered in ¾-in. glass tubes with rubber stoppers. The first of three steel rods—A, B and C—were each cut in two pieces and reconnected by means of short pieces of plastic rod. Wires were attached to the top and bottom ends of the

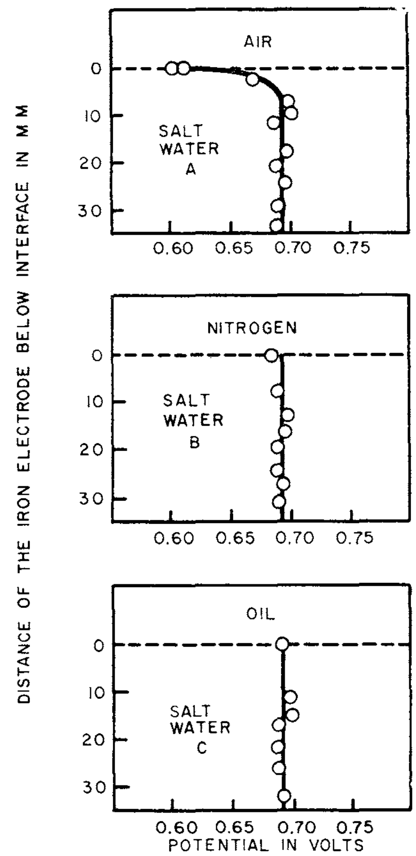


FIG. 3—EFFECT OF IMMERSION DEPTH ON POTENTIAL OF WATER-LINE CORROSION CELL.

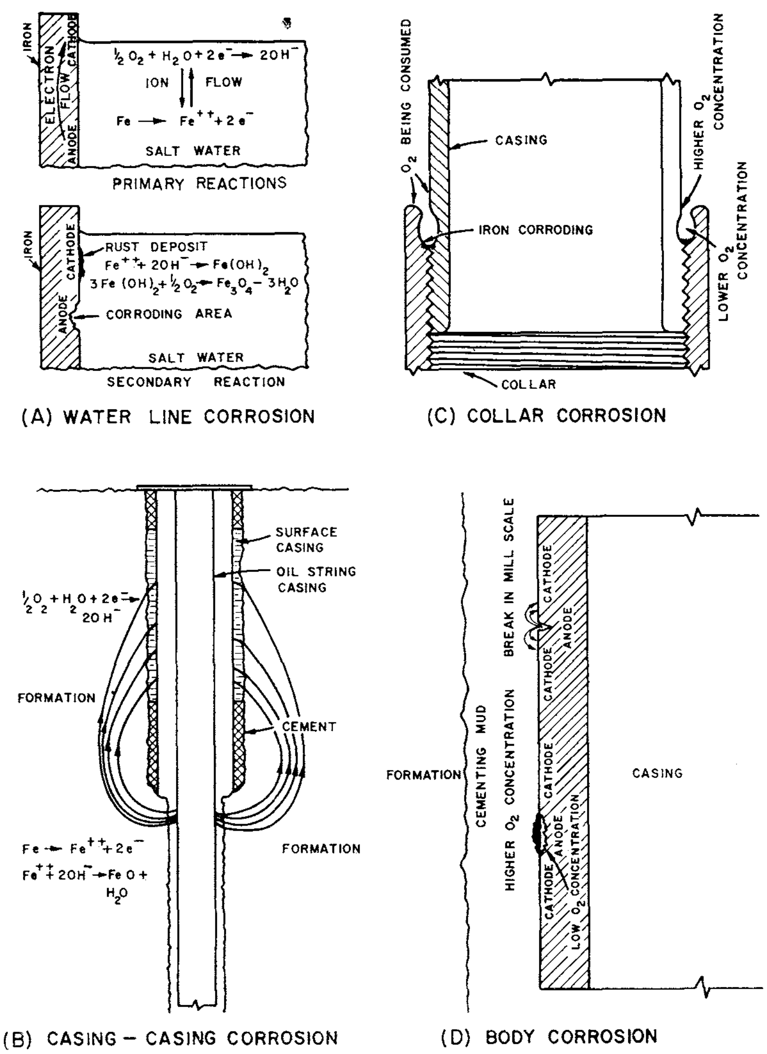


FIG. 2—MECHANISMS OF THE VARIOUS TYPES OF CASING CORROSION.

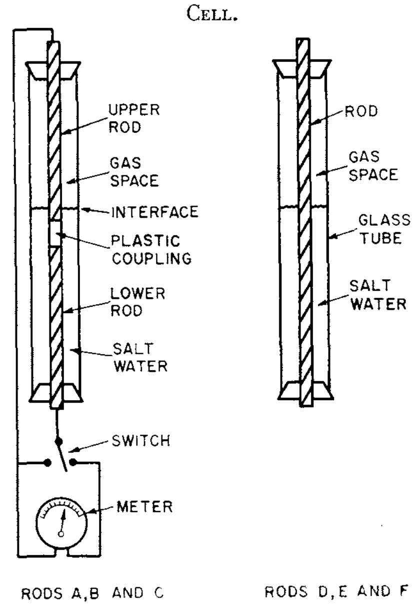


FIG. 4—ARRANGEMENT OF TEST RODS USED TO MEASURE THE CURRENT CAPACITY OF WATER-LINE CORROSION CELLS.

SED_RT_0022

three re-assembled rods. Each pair of wires was connected outside the glass tube to complete the cell. On occasion, these wires were disconnected and reconnected to an ammeter to measure the current flowing between the two sections of each rod. The remaining three rods—D, E and F—were left intact. The glass tubes were mounted in a vertical position, and formation water was poured in each tube so that the lower half of each rod was submerged. Fluid in the tubes containing the plastic-separated rods was adjusted so that the top of the plastic coupling was ½-in. below the water-air interface.

Rod A was allowed to stand for 60 days in formation water with the water surface open to the air. Rod B was allowed to stand for 10 days, and then a small amount of oil was poured on top of the water for the remaining 50 days of the test. Rod C was treated similarly to Rod B except that the oil contained 1 per cent of an oil-soluble corrosion inhibitor. The three unbroken rods—D, E and F—also were permitted to stand partially submerged in the formation water for the 60-day test. During this period, air was maintained above the water line on Rod D, an oil-air interface was maintained above the water line on Rod E and nitrogen gas was maintained above the water on Rod F.

Results of current measurements are shown in Fig. 5 for each of the three separated rods. Fig. 6 shows the appearance of all six rods after the 60-day test. The current produced in such a corrosion cell will flow for as long a time as the differential oxygen concentration exists.

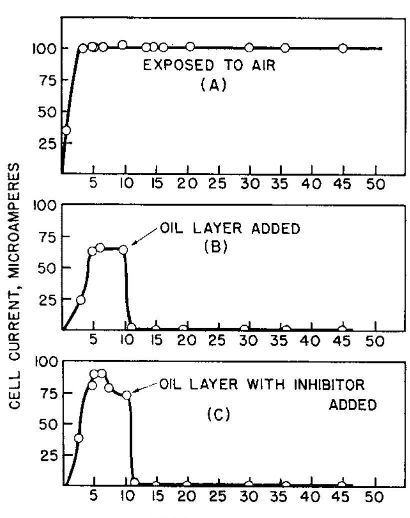


FIG. 5—EFFECT OF OIL LAYER ON WATER-LINE CORROSION-CELL CURRENT.

The anodic action is sharply localized on the iron below the liquid surface. Action of the water-line corrosion cell can be minimized by placing a refined oil layer on the water surface or by removal of oxygen from the gas space above the liquid surface.

CASING-CASING CORROSION

The potentials of casing-casing corrosion cells were next studied. Muds of different pH and different molecular oxygen concentrations were obtained, and the potentials of iron electrodes against a saturated calomel electrode were measured in these muds. Results of these measurements are shown in Fig. 7. Iron became more cathodic with increasing pH of the muds. Between pH 9.0 and pH 13.0, an iron potential was shown to be more anodic as the oxygen concentration in the mud was decreased.

The nature of the current density on an oil-string casing was studied using a model in which the oil string and the surface string were separate electrodes. The current was found to be quite concentrated along the length of oil string immediately below the shoe of the surface string. Decrease in current density below

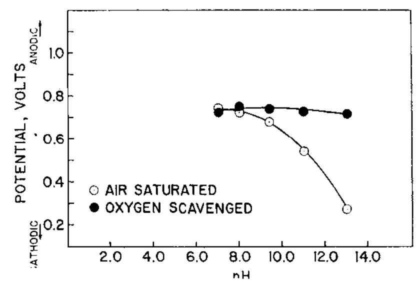


FIG. 7—EFFECT OF pH ON THE POTENTIAL OF IRON IN AIR-SATURATED AND OXYGEN-SCAVENGED DRILLING MUD AT 150°F.

this point was found to behave according to accepted principles of potential theory.

An additional study was carried out with the apparatus shown in Fig. 8. The cathode was made out of three short sections of iron pipe welded together concentrically, and the anode was made of a small iron coupon. Welded areas of the cathode were coated with plastic to eliminate galvanic couples at the weld joints. The area of the cathode was about 330 sq in. The area of the anode was 2 sq in. The cathode was placed in mud at a pH of 12.1, the anode in mud at a pH of 8.5. The two electrodes then were shorted together for

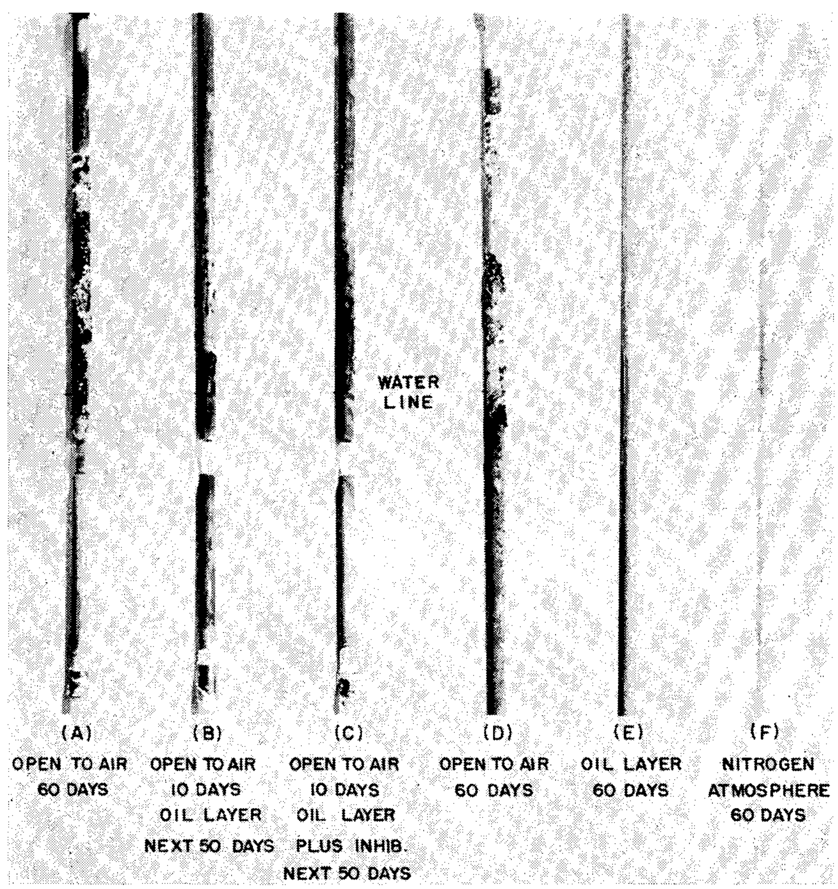


FIG 6—APPEARANCE OF TEST RODS AFTER 60 DAYS OF PARTIAL SUBMERSION IN FORMATION SALT WATER.

SED_RT_0023

several days. The results of measurements are shown in Table 1.

The results of these tests show that corrosion cells with potentials of 0.2 to 0.6 v might be expected between two casings in contact with aerated muds of different pH. The current-producing capacity of such cells is substantial. During tests on casing models, the current from an oil string that is anodic was shown to be concentrated at the surface area where casing-casing corrosion has been found to be severe in the field. It further was found that the potential of a casing becomes more anodic as the oxygen concentration decreases.

COLLAR CORROSION

The potential of a collar-corrosion cell was measured in mud utilizing the recess between a joint of 9¼-in. casing and a casing collar. A ring made from 0.005-in. diameter iron wire was placed in the bottom of the recess, and its potential was measured with respect to another iron-wire ring outside of the recess. The arrangement of wires in this apparatus is shown in Fig. 9(A). The iron wires were protected from contact with either the casing or the collar by means of heavy cotton cloth. The measured potentials of the two iron wires are compared in Table 2. The current-carrying capacity of the collar corrosion cell is given also in Table 2.

Test results indicated that a potential of about 0.2 v might be expected from the collar corrosion cell. The current-producing capacity of such a cell is substantial and can be expected to produce current so long as the differential oxygen concentration exists. Observations also indicated that the anode was located so that the corrosion would be concentrated on the first exposed thread of the joint.

BODY CORROSION

A corrosion cell consisting of bare iron and mill scale was studied first. Electrodes of mill scale and mill-scale-coated iron were prepared in an electric furnace at 1,800°F. The potentials of the bare-iron and mill-scale electrodes were measured against a saturated calomel electrode in muds of various pH's. Results of these measurements are shown in Table 3.

Other electrodes of mill-scale-coated iron were assembled with sand-blasted iron electrodes in sealed jars, as shown in Fig. 9(B). The muds placed in these jars were given various treatments to introduce or remove molecular oxygen. Electrical currents produced by these cells were measured with a zero-resistance milliameter and are given in Table 4.

The results of tests on mill-scale electrodes showed that potentials of 0.2 to 0.3 v can be produced by a bare iron-mill scale corrosion cell. The current-producing capacity of this cell is sufficient to last indefinitely when molecular oxygen is available, and for weeks even if molecular oxygen is not available. Ultimately, as was observed at the end of several years, the current flow stops when sources of oxygen are depleted.

The effect of formation water on body corrosion was studied next. This study was undertaken because of the severity of corrosion in some oil fields where high-pressure formation fluids were believed to aggravate external casing corrosion. In laboratory tests, penetration of high-pressure formation water into cementing mud was found to follow vertical paths in the mud and was thought possibly to account for pitting along one side of a casing joint.

Iron electrode potentials measured in typical formation waters of pH's 6.5 to 8.0 are shown in Table 5. These potentials are compared with potentials of the same iron electrodes in high-pH aerated muds. The corrosion capacity expressed as coupon weight loss for the anode of a cell made from these electrodes also is given. The tests again showed that potentials of the corrosion cells made by the formation water-mud con-

TABLE 1—WEIGHT LOSS OF ANODE IN SHORTED CASING-CASING CORROSION CELLS IN 12-DAY TEST

Cathode Sol.	Cathode pH	Cathode Init. Poten. (v) (−)	Anode Sol.	Anode pH	Anode Init. Poten. (v) (−)	Weight Loss (gm) Cal.	Weight Loss (gm) Meas.
Mud	12.1	0.170	Mud	8.5	0.760	0.090	0.117

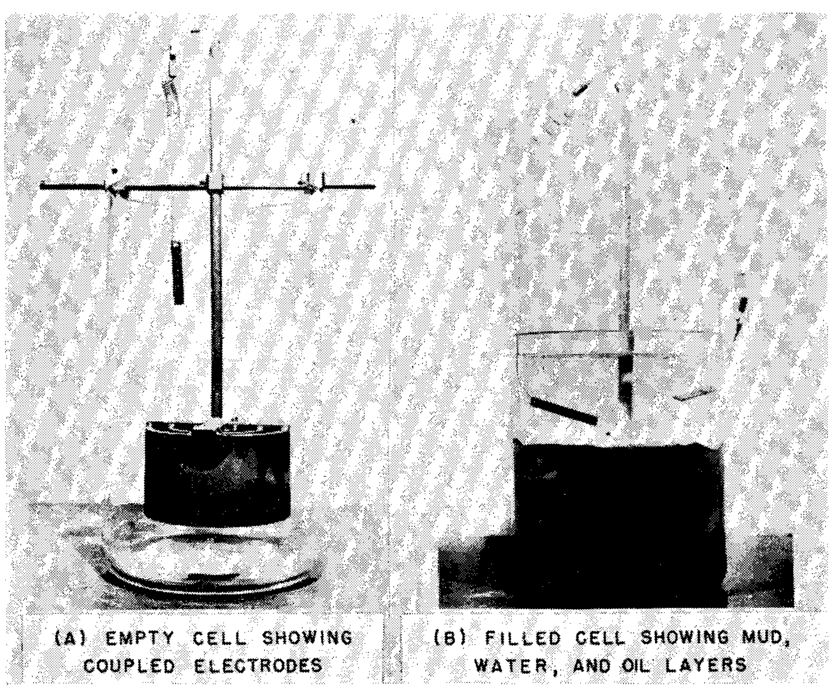


Fig. 8—Corrosion Cell for Study of Electrolytic Capacity of Iron in Different Fluids

TABLE 2—CORROSION POTENTIALS AND CURRENTS MEASURED IN RECESS BETWEEN CASING JOINT AND CASING COLLAR

Sol.	pH	Potential of Iron Wires (v) (−) Recessed	Exposed	Current (µamps) at End of 3-Min. Between Wires Shorted Through 10-ohm Resistor
Mud	12.0	0.622	0.352	2.00
Mud	10.5	0.680	0.650	0.65

TABLE 3 — POTENTIALS OF MILL-SCALE AND IRON ELECTRODES IN AN ALKALINE DRILLING MUD PURGED WITH NITROGEN

Time (mos.)	Mill-Scale Iron Elec. Poten. (v) (−)	Sand-Blasted Iron Elec. Poten. (v) (−)	Poten. Diff. (v)
Start	0.272	0.540	0.268
1	0.284	0.513	0.229
2	0.310	0.503	0.193
3	0.329	0.483	0.154
4	0.338	0.470	0.132

TABLE 4—CURRENT MEASURED BETWEEN MILL-SCALE AND IRON ELECTRODES IN ALKALINE DRILLING MUD PURGED WITH NITROGEN

Time (mos.)	Current (milliamps) Shorted Electrodes	Unshorted* Electrodes
Start	0.055	0.030
1	0.045	0.090
2	0.040	0.070
3	0.001	0.105
4	0.065	0.107

*Instantaneous reading.

SED_RT_0024

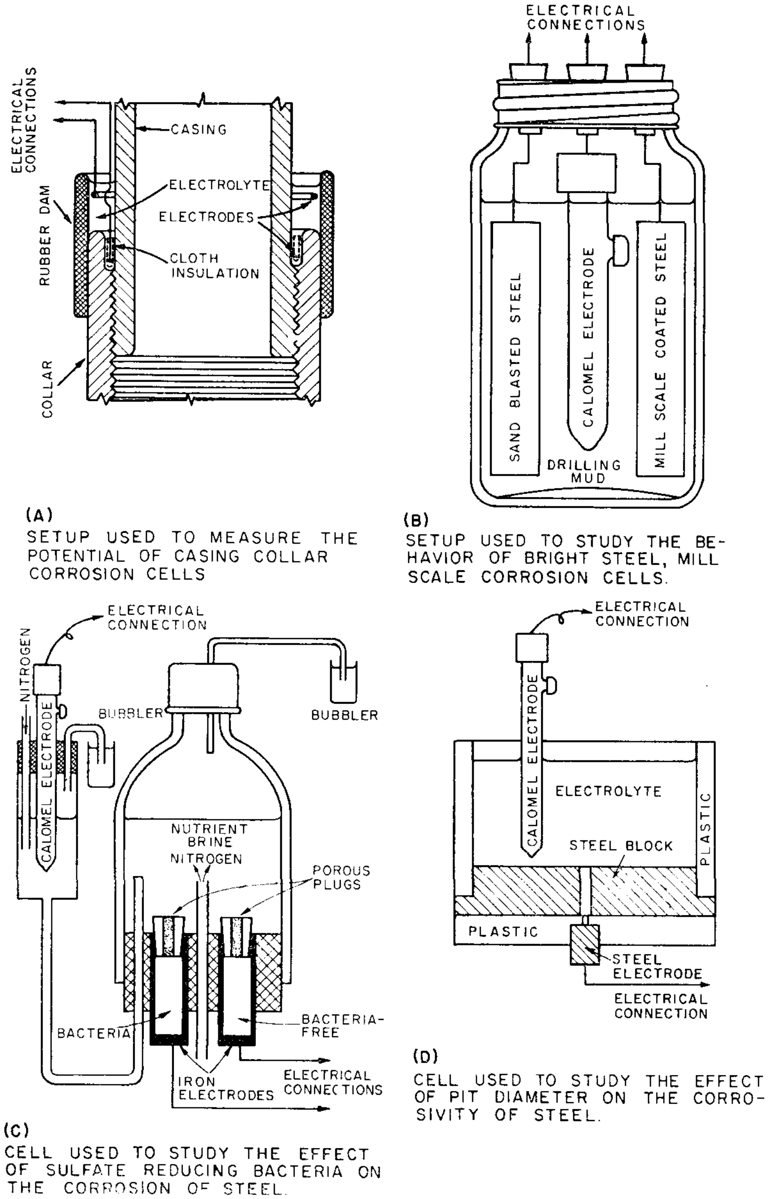


FIG. 9—VARIOUS LABORATORY SET-UPS USED TO STUDY THE PROCESSES OF EXTERNAL CASING CORROSION.

tacts on the casing are reduced to a low value when molecular oxygen is removed from the mud.

The effect of sulfate-reducing bacteria was investigated as a promoter of body corrosion. The study was carried out because iron sulfides frequently are found in pits on oil-string casing.[2] Conventional cementing mud was considered too alkaline to support appreciable growth of sulfate reducers or to allow metal contamination with these bacteria. Therefore, artificial iron pits were used which were not precontaminated with sulfate-reducing bacteria, and solutions were used which might be present in a pit filled with nearly neutral iron oxide and sulfide corrosion products. The object of the study was to discover if sulfate-reducing bacteria could grow in a casing pit and could make the iron more anodic on this area. A general mechanism for corrosion by sulfate-reducing bacteria was not tested.

Electrode potentials were measured for iron covered with colonies of sulfate-reducing bacteria. The apparatus used to carry out the study is shown in Fig. 9(C). Pieces of iron were sand-blasted and placed in the apparatus under anaerobic conditions. Nutrient solutions were prepared containing sulfate-reducing bacteria. The cultures then were incubated at 90°F inside the test apparatus. Potentials of the iron electrodes referred to saturated calomel electrodes were measured as a function of time and ahe shown in Table 6. These potentials are compared also with potentials of iron in aerated brine but without bacteria. The increased current density that is possible at an iron anode promoted by a local colony of sulfate-reducing bacteria was estimated to be appreciable. Current densities, however, were not measured because of the difficulty in determining the area of the bacterial activity.

TABLE 6—POTENTIALS OF IRON ELECTRODES IN BRINE SHOWING DIFFERENCES PRODUCED BY GROWTH OF SULFATE-REDUCING BACTERIA

Time (days)	pH of Brine	Potential of Iron (v) (−) Bact. Growing	No Bact. Growing
Start	7.0	0.769	0.769
1	7.0	0.771	0.749
2	7.0	0.768	0.743
3	7.0	0.766	0.736
Start	8.0	0.762	0.736
1	8.0	0.774	0.768
2	8.0	0.770	0.757
3	8.0	0.765	0.748

GROWTH OF CORROSION PIT

The effect of pit diameter on pitting activity was studied because of the frequent occurrence of localized external attack on casings. The study was confined to determining the influence of pit diameter on the potential that might develop at the bottom of a corrosion pit. The apparatus used in the experiments is shown in Fig. 9(D). To represent pits, a number of holes of different diameters were made in ½-in.-thick carbon steel blocks. An iron electrode was sealed across the bottom of each hole, and each of these electrodes was insulated from the steel block by means of a plastic plate. An aerated polyphosphate solution, sometimes used for wash water in oilwell cementing operations, was used in the test cell. The solution filled all of the holes and covered the top of the test block to a depth of ⅜ in. The potential of each iron electrode was measured against a saturated calomel electrode over a period of many days.

As shown in Fig. 10, the potential at the bottom of each hole became more cathodic with increase in hole diameter at the end of the test. The

TABLE 5—WEIGHT LOSS OF ANODES IN SHORTED CORROSION CELLS IN 14-DAY TEST

Cathode Sol.	pH	Init. Poten. (v) (−)	Anode Sol.	pH	Init. Poten. (v) (−)	Weight Loss (gm) Calc.	Meas.
Mud A	12.0	0.237	FW**	7.1	0.771	0.137	0.120
Mud B	12.3	0.372	FW	7.3	0.737	0.135	0.139
Mud A*	12.3	0.531	FW	7.2	0.717	0.125	0.132

*Treated with corrision inhibitor.
**FW = Formation Water.

SED_RT_0025

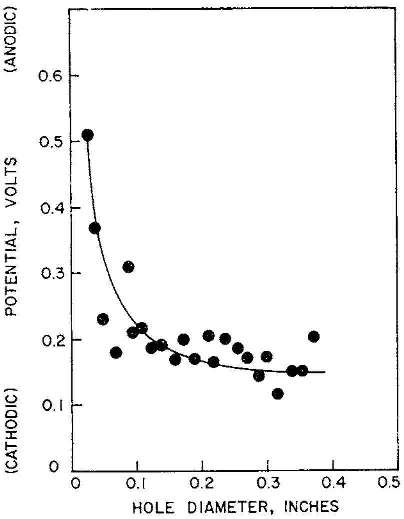


FIG. 10—EFFECT OF PIT DIAMETER ON THE ANODIC CHARACTER OF CORROSION PITS.

results of this test indicate that differential aeration pits tend to become sharper as they progress into the iron.

SECONDARY FACTORS IN CASING CORROSION

The causes of corrosion previously discussed describe the necessary and sufficient conditions for developing the highly localized character of casing corrosion. However, other factors also may be involved in the corrosion rate when the anodic areas are small. Three of these factors may have a significant effect on the life of some casings because they tend to accelerate the pitting processes by flow of gross positive current out from large areas of the casing.

An experiment was considered necessary to demonstrate this acceleration of pitting by outward flow of positive current from a casing surface. Therefore, a prototype casing coated with mill scale was built, with a small isolated area of metal left exposed. Positive currents of varying strengths from an external cathode were used to increase the average anode current density on the casing surface when it was immersed in mud. Current densities then were measured for positive currents leaving the exposed area. When the ratio of mill-scale-covered area to exposed area was 60:1, all applied external currents that created an average current density above 2.5 milliamp/sq ft resulted in a greater than-average discharge current density from the exposed area of the casing. When the ratio of mill-scale-covered area to exposed area was 1,000:1, a greater-than-average discharge current density occurred when the average applied current density exceeded 1.2 milliamp/sq ft.

FLOW LINE CURRENT

A positive current of sufficient strength flowing into a well from attached flow lines, as shown before, tends to accelerate pitting corrosion at almost any place on the casing. The effect is similar to one where the cathode of the corrosion cell is made much larger because the surface flow lines become a part of the casing cathodic area. Current lines to some degree follow the classic potential theory lines through the ground when no highly localized anodic areas exist. If highly localized anodic areas do exist, however, the current density at these areas may be increased, and pitting may tend to be more severe.

INTERFERENCE CURRENTS

A positive current from a cathodic-protection anode may flow underground first to an unprotected casing and then return to a protected casing if the unprotected casing is in the electrical field of the protected well. Current flowing in this path is called interference current. Uniform return of the interference current from the unprotected casing may be expected if there are no localized anodic areas on the unprotected casing. If there are localized anode areas, interference current will accelerate pitting corrosion on the unprotected casing.

SELF-POTENTIAL CURRENTS

Self-potential currents flowing in wellbores have been suggested as a primary source of casing corrosion for several years.[6] However, the experiment described herein suggests that self-potential currents are only secondary factors. The positive current flowing on a casing from a point opposite a shale bed and leaving the casing at a point opposite a sand formation containing brine usually is discharged uniformly over the casing surface. If anodic areas are highly localized, then a positive self-potential current of sufficient magnitude would tend to leave the anodic areas at greater-than-average current density. Self-potential in this case has the effect of increasing the potential of the local corrosion cells.

FLOWING FORMATION WATER

Body corrosion may be accelerated if formation water flows behind the casing from one formation to another. Flow of formation water will increase the chance of water contact with the casing surface. Current in the corrosion cells that is set up at the formation water-mud boundary is increased by the movement of the water. The current-producing capacity of this cell will be greater than in the static system, and the current will last a longer time. The accelerative corrosion effects of the flowing formation water are not produced, however, if oxygen is absent from the water and if oxygen is also removed from the mud surrounding the casing.

LABORATORY STUDY OF OXYGEN SCAVENGERS

The four kinds of casing corrosion discussed in this paper were seen to be largely the result of differential oxygen concentration attack. Therefore, oxygen scavengers were investigated in the laboratory as a means of controlling the external corrosion of oil-string casing.

Laboratory investigations showed that water-soluble reducing agents, such as ferrous chloride, ferrous hydroxide, powdered iron, stannous chloride and hydrazine, react with dissolved oxygen in alkaline drilling muds. These investigations also showed that the potential of iron in such treated mud shifts in the anodic direction as oxygen is consumed. Complete removal of the dissolved oxygen resulted in virtual cessation of corrosion.

Standard API tests of drilling-fluid properties showed that the use of ferrous chloride or stannous chloride adversely affected the physical properties of some test fluids and that mud reconditioning frequently would be necessary if these oxygen scavengers are used. Similar tests with hydrazine showed no adverse effects. Table 7 compares the physical properties of a typical alkaline-emulsion drilling fluid before and after the addition of 1.5 lb/bbl of 35 per cent hydrazine-water solution. Table 7 shows that the addition of 1.5 lb/bbl of hydrazine had no adverse effect on the drilling-fluid properties. The amount of hydrazine used in this test is estimated to be about 100 times the amount needed to consume the oxygen dissolved in typical air-saturated drilling fluid.

TABLE 7—EFFECT OF HYDRAZINE ON THE PHYSICAL PROPERTIES OF A TYPICAL ALKALINE DRILLING FLUID

Fluid Property	Before Treatment	After Treatment
Weight, lb/cu ft	78	78
Marsh Viscosity $\left(\frac{1,500 \text{ cc}}{1 \text{ qt}}\right)$, sec.	45	45
Gel Strength (10 min)	0.0 & 1.5	0.0 & 1.5
Water Loss (30 min; 100 psi), ml	1.2	1.2
Filter Cake (API), in.	1/32	1/32
pH	12	12
Temperature, °F	135	135

SED_RT_0026

Standard tests also were made to study the effect of hydrazine on the physical properties of set cement. Results of the tests are shown in Table 8.

Differences noted in the tensile and compressive strengths of treated and untreated cements are not considered to be significant. The spread of data for multiple tests was greater than the difference in the averages shown in Table 8. Apparently, hydrazine has no adverse effect on the physical properties of oilwell cement.

Electrochemical cells were set up to study the effect of hydrazine on the potential of J-55 steel electrodes in treated and untreated alkaline drilling-fluid samples. The objective of the study was to find out if the potential of iron could be shifted sufficiently far in the anodic direction to prevent corrosion attack on the test coupons. Potentials were measured for several months, and results of the tests are shown in Table 9.

Table 9 shows that the initial potential of sand-blasted J-55 steel in untreated drilling fluid was about 390 mv (538 to 146 mv) more anodic (negative) than the mill-scale-coated J-55 steel. This indicates that the bare steel was corroding because of the bare steel-mill scale couple existing in the oxygen-saturated mud. Such a couple can produce rapid pitting corrosion if the area of bare steel is small compared to the surrounding area of mill scale. The table shows also that the potentials of both the bare steel and mill-scale-coated steel are shifted in the anodic direction by the consumption of available oxygen. In the untreated mud, oxygen consumption is accomplished by the corrosion reaction shown by Eqs. 1 through 4. In the hydrazine-treated mud, oxygen reacts with the hydrazine and is converted to water.

$$N_2H_4 + O_2 = N_2 + 2H_2O \quad . \quad (5)$$

Potential shifts in the anodic direction indicate a reduction in the general corrosion tendency, while the disappearance of potential differences between the bare steel and the mill-scale indicates the disappearance of the tendency for pitting corrosion.

This reaction shows that hydrazine can have no deleterious effect on the drilling mud because its reaction products are only water and nitrogen gas. Hydrazine is an alkaline material and will have a slight tendency to raise the pH of some treated muds.

The next section of the paper describes results of field tests with hydrazine injected into the mud used in cementing several wells.

HYDRAZINE FIELD TESTS

Hydrazine was injected into the drilling fluid left behind each casing in four test wells in two Southern California oil fields. Three untreated wells also were selected in the same field for comparison purposes. Treated and untreated test wells in each field were selected because of the similarity in depth, casing size, method of completion and kind of mud used to drill and complete each well. Information about the test wells is given in Table 10.

Hydrazine effectiveness can be estimated from the difference in the cathodic currents needed to protect treated and untreated wells. Consumption of available oxygen reduces corrosion and reduces the amount of cathodic current needed to protect a well. Comparison of current requirements for treated and untreated wells, therefore, should be an indirect measure of hydrazine effectiveness. Cathodic current requirements during these tests were measured by the "null" potential method that was first proposed by Pearson[7] in 1942.

A series of direct currents of increasing strengths was applied to each test casing, and the potential of each casing was measured between the wellhead and a remote reference electrode (Cu, $CuSO_4$ half cell) for each current immediately after the current was interrupted. Cathodic current requirements then were estimated from the intersection of the straight-line portions of the potential vs log-current curves plotted from this null-potential data. Representative curves are shown in Fig. 11.

Fig. 11 shows that a current of 36 amps would be needed to protect untreated Well B-1. Fig. 11 also shows that hydrazine-treated Well B-5 required only a current of 17 amps for protection. Current requirements were determined for both wells approximately three years after each was completed. The lower current required to protect Well B-5 is attributed to oxygen scavenging by the hydrazine used to treat the well.

Current requirements were determined for each test well at various times over a four-year period. Results of the determinations are presented in Table 11 and plotted as current-vs-time curves in Figs. 12 and 13.

In Fig. 12 the assumption is made that the initial current requirements for Wells A-1 and A-2 are approximately 25 amps. This value was chosen because it is typical of current requirements measured for wells in the area.

Fig. 12 shows a marked reduction in current required during the first year for both the untreated and treated wells. The current-requirement reduction in the untreated well is attributed to partial oxygen consumption by corrosion. The much greater and more rapid reduction in current requirements in the treated well is attributed to the action of the hydrazine. It also will be noted that after the first year the current required to protect the treated well was

TABLE 8—EFFECT OF HYDRAZINE ON THE PHYSICAL PROPERTIES OF CLASS E OILWELL CEMENT*

Strength Property	Untreated		Hydrazine-Treated	
	1-Day	7-Day	1-Day	7-Day
Avg. Tensile (psi)	316	425	290	465
Avg. Compress. (psi)	3506	7361	2627	6031

*40-per cent slurry cured at 160°F.

TABLE 9—EFFECT OF HYDRAZINE ON THE POTENTIALS* OF SAND-BLASTED AND MILL-SCALE-COATED J-55 STEEL IN AN ALKALINE-EMULSION DRILLING FLUID

Hydrazine	Potential (− mv)**			
	Initial		Final	
(lb/bbl)	SB	M-S	SB	M-S
0	538	146	525	513
0.2	577	363	619	620
1.0	575	462	643	652

*Potentials are referred to saturated calomel scale; add 80-mv to convert to Cu, $CuSO_4$ scale.

**SB = Sand Blasted, M-S = Mill-Scale.

TABLE 10—PERTINENT INFORMATION ABOUT THE TEST WELLS

Well No.	Well Depth (ft)	Hydrazine Treated	Kind of Drilling Mud
Field A			
A-1	10,100	No	High pH Oil Emul.
A-2	10,658	Yes	High pH Oil Emul.
Field B			
B-1	14,260	No	High pH Oil Emul.
B-2	13,950	No	High pH Oil Emul.
B-3	13,350	Yes	High pH Oil Emul.
B-4	14,195	Yes	High pH Oil Emul.
B-4*	13,947	Yes	High pH Oil Emul.
B-5	13,955	Yes	High pH Oil Emul.

*Well B-4 was re-drilled and recompleted.

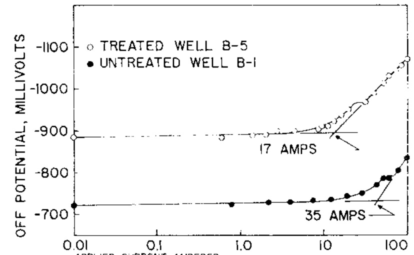


FIG. 11—EFFECT OF HYDRAZINE ON CATHODIC-PROTECTION CURRENT REQUIREMENTS.

TABLE 11—CURRENT REQUIRED TO PROTECT THE TEST WELLS

Well No.	Time from Completion (years)	Cathodic Current (amps)
Field A		
A-1	1.5	15½
	4.6	16
A-2	0.95	7½
	4.1	10
Field B		
B-1	2.0	35
	3.0	36
	4.8	20
B-2	0.98	28
	2.3	27½
	4.0	23
B-3	0.46	25
	0.79	23
	3.5	15
B-4	0.26	32
	0.59	28
Re-drill	1.8	15
B-5	0.19	20
	0.60	18
	2.9	17

TABLE 12 — HYDRAZINE REQUIREMENTS FOR VARIOUS VOLUMES OF DRILLING MUD

Drilling Mud (bbl)	Approx. Well Depth (ft)	35% Hydrazine	
		Gal	Lb
Up to 100	Up to 4000	6	48
100-200	4000- 6000	12	96
200-300	6000- 8000	18	144
300-500	8000-12000	30	240

nearly 45 per cent less than for the untreated well. Undoubtedly less corrosion took place on the outside of the casing in the treated well than on the casing of the untreated well during the first three to four years after completion.

Fig. 13 shows the effectiveness of hydrazine in another oil field. In each instance, the current required to protect a treated well rapidly decreased during the first year after completion and either continued a downward trend or leveled off during the next one to two years. There is no indication of an increase in current, which presumably could indicate depletion of the hydrazine and an influx of oxygen. Fig. 13 also shows that current requirements for the two untreated wells (B-1 and B-2) decreased with time, but at a much slower rate than in the treated wells. Hydrazine apparently makes its greatest contribution to the prevention of external casing failure during the first 12 to 18 months after a well is completed. This is a particularly important period because it is during this period that differential oxygen concentration

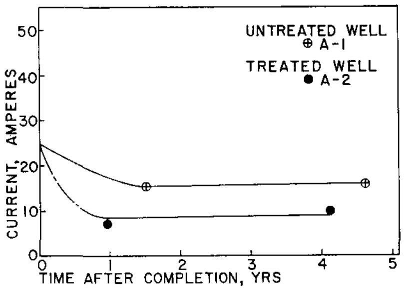


FIG. 12—EFFECT OF HYDRAZINE ON THE CORROSIVITY OF TEST WELLS IN FIELD A.

cells can cause the greatest amount of damage through pitting corrosion attack.

The favorable results from the laboratory and field tests showed that the use of hydrazine in the cementing mud was an effective, inexpensive and easily applied method for controlling external casing corrosion. The material has been used in over 200 wells of Standard Oil Co. of California.

CONCLUSIONS

1. External casing corrosion can be classified into four major types: water-line, casing-casing, collar and body. A mechanism for each type of external corrosion can be developed from principles of differential aeration.

2. Casing leaks are caused by highly localized corrosion attack.

3. The use of oxygen scavengers to control the corrosion attack is based on corrosion mechanisms developed from the principles of differential aeration. Laboratory tests show that hydrazine is a convenient and effective oxygen scavenger for use in oil wells.

4. Field tests of hydrazine show that the use of hydrazine in cementing mud materially reduces cathodic-protection current requirements for treated wells. This reduction in current requirements is interpreted to indicate substantial consumption of oxygen around the oil-string casing and consequent reduction in external corrosion.

5. Hydrazine appears to have par-

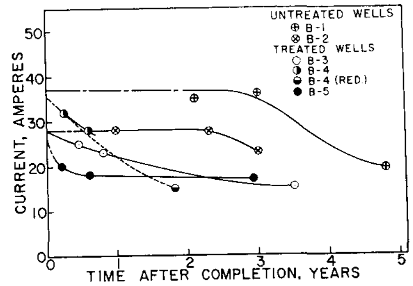


FIG. 13—EFFECT OF HYDRAZINE ON THE CORROSIVITY OF TEST WELLS IN FIELD B.

ticular usefulness for removing oxygen during the first 12 to 18 months after well treatment. Hence, a significant amount of corrosion can be prevented early in the life of a well when differential oxygen concentration cells are most active and able to cause pitting corrosion at a high rate.

6. Test results do not show any significant reduction in hydrazine effectiveness even after use in wells for three to four years. It is possible that a major part of the effectiveness may last the life of the treated well.

ACKNOWLEDGMENT

The authors wish to express their appreciation to R. V. Scott of Standard Oil Co. of California, Western Operations, Inc., for his cooperation and assistance in carrying out the field evaluation of hydrazine.

REFERENCES

1. Battle, J. L.: *Corrosion* (1957) **13,** 62.
2. Greathouse, W. D., Lehman, J. J., Landers, J. E. and Sudbury, J. D.: "Field Evaluation of Cathodic Protection of Casings", *Trans.,* AIME (1959) **216,** 354.
3. Evans, U. R.: *Jour. Inst. Metals* (1923) **30,** 239.
4. Evans, U. R.: *An Introduction to Metallic Corrosion,* Arnold Press (1951).
5. Doig, K. and Wachter, A.: *Corrosion* (1951) **7,** 213.
6. de Witte, L. and Radd, F. J.: "Corrosion of Oil Well Casing by Earth Currents", *Trans.,* AIME (1955) **204,** 66.
7. Pearson, J. M.: *Trans.,* Electrochem. Soc. (1942) **81,** 485.

★★★

NACE SP0186-2007
(formerly RP0186-2001)
Item No. 21031

Standard Practice

Application of Cathodic Protection for External Surfaces of Steel Well Casings

Reaffirmed 2007-03-10
Reaffirmed 2001-09-20
Reaffirmed September 1984
Approved March 1986
NACE International
1440 South Creek Drive
Houston, TX 77084-4906
+1 281/228-6200

ISBN:1-57590-134-X

SED_RT_0029

Foreword

Oil and gas wells represent a large capital investment. It is imperative that corrosion of well casings be controlled to prevent loss of oil and gas, environmental damage, and personnel hazards, and in order to ensure economical depletion of oil and gas reserves.

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. 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.

This standard was originally prepared in 1986 by Unit Committee T-1E on Cathodic Protection and Task Group (TG) T-1J-2, a component of Unit Committee T-1J on Storage Wells. It was reaffirmed in 1994 by Unit Committee T-1E, and in 2001 and 2007 by Specific Technology Group (STG) 35 on Pipelines, Tanks, and Well Casings. The STG membership consists of representatives from oil and gas producing and storage companies, equipment manufacturers, consulting firms, and CP service companies. Included in the membership are persons involved in design, consulting, research, construction, maintenance, and manufacturing and supply of materials, all of whom are concerned with the establishment and maintenance of cathodic protection systems used with well casings. This standard is issued by NACE under the auspices of STG 35.

In NACE standards, the terms *shall, must, should,* and *may* are used in accordance with the definitions of these terms in the *NACE Publications Style Manual*, 4th ed., Paragraph 7.4.1.9. *Shall* and *must* are used to state mandatory requirements. The term *should* is used to state something considered good and is recommended but is not mandatory. The term *may* is used to state something considered optional.

NACE International

Standard Practice

Application of Cathodic Protection for External Surfaces of Steel Well Casings

Contents

Section 1: General

1.1 This standard presents acknowledged procedures for the control of external corrosion of steel well casings by applying CP. This standard is intended to be a guide for establishing minimum requirements for corrosion control when CP is practical and cost-effective.

1.2 This standard does not designate practices for specific situations. The complexity of some casing spacing, subsurface proximity to other casings, and environmental conditions preclude standardizing the application of CP. Deviation from this standard may be warranted in specific situations, provided those in responsible charge can demonstrate that the objectives expressed in this standard have been achieved.

1.3 This standard does not include corrosion control methods based on chemical control of the environment.

1.4 This standard applies only to well casing exteriors and not to internal corrosion, or to corrosion of other surface or downhole equipment.

1.5 The provisions of this standard should be applied under the direction of competent persons knowledgeable in the physical sciences, principles of engineering, and mathematics. They may have acquired knowledge by professional education and related practical experience and should be qualified to practice corrosion control for well casings by the use of CP. Such persons may be registered professional engineers recognized as being qualified as corrosion specialists in the appropriate fields of corrosion control by NACE International. Their professional activities should include suitable experience in well casing corrosion control practices.

Section 2: Definitions[1]

Alternating Current (AC): Current whose direction changes with time.

Ampere: Unit of current that is one coulomb per second.

Anode: The electrode of an electrochemical cell at which oxidation occurs. Electrons flow away from the anode in the external circuit. Corrosion usually occurs and metal ions enter the solution at the anode.

Backfill: Material placed in a hole to fill the space around the anodes, vent pipe, and buried components of a cathodic protection system.

Casing Potential Profile: Voltage (IR) drop and current direction versus casing depth is plotted. Amount of current is determined from the IR drop and casing resistance. (See nonmandatory Appendix A.)

Casing-to-Electrolyte: See *Structure-to-Electrolyte Potential.*

Casing-to-Reference Electrode: See *Structure-to-Electrolyte Potential.*

Cathode: The electrode of an electrochemical cell at which reduction is the principal reaction. Electrons flow toward the cathode in the external circuit.

Cathodic Protection: A technique to reduce the corrosion of a metal surface by making that surface the cathode of an electrochemical cell.

Cement: Cement slurry fills the space between the casing and the sides of the wellbore to a predetermined height above the bottom of the well.

Continuity Bond: A connection, usually metallic, that provides electrical continuity between structures that can conduct electricity.

Corrosion: The deterioration of a material, usually a metal, that results from a reaction with its environment.

Counterpoise: A conductor or system of conductors arranged beneath a power line, located on, above, or most frequently, below the surface of the earth and connected to the footings of the towers or poles supporting the power line.

Coupling (or Collar): Well casing joint connector.

Current Density: The current to or from a unit area of an electrode surface.

[1] Definitions in this section are those presented in the *NACE Glossary of Corrosion-Related Terms* and those that reflect the common usage among practicing corrosion control personnel. In many cases, in the interest of brevity and practicality, the strict scientific definitions are abbreviated or paraphrased.

Deep Groundbed: One or more anodes installed vertically at a nominal depth of 15 m (50 ft) or more below the earth's surface in a drilled hole for the purpose of supplying cathodic protection.

Dielectric Coating: A coating that does not conduct electricity.

Direct Current (DC): Current whose direction does not change with time.

Drainage: Conduction of electric current from an underground or submerged metallic structure by means of a metallic conductor.

E-log-I: A test that indicates the cathodic protection current required by a slope change on the cathodic polarization diagram. (Refer to nonmandatory Appendix B.)

Electrical Isolation: The condition of being electrically separated from other metallic structures or the environment.

Electric Log: A survey taken in the open borehole of a well to determine the lateral formation resistivity.

Electrolyte: A chemical substance containing ions that migrate in an electric field. For the purposes of this standard, electrolyte refers to the soil or liquid adjacent to and in contact with a buried or submerged metallic structure, including the moisture and other chemicals contained therein.

Electroosmotic Effect: The effects of the movements in an electric field of liquid with respect to colloidal particles immobilized in a porous diaphragm or a single capillary tube.

Fault Current: A current that flows from one conductor to ground or to another conductor due to an abnormal connection (including an arc) between the two. A fault current flowing to the ground may be called a ground fault current.

Field: A group of wells in close physical proximity, usually considered a unit when applying cathodic protection. It may be an oil or natural gas production field or a natural gas storage field.

Foreign Structure: Any metallic structure that is not intended as a part of a system under cathodic protection.

Galvanic Anode: A metal that provides sacrificial protection to another metal that is more noble when electrically coupled in an electrolyte. This type of anode is the electron source in one type of cathodic protection.

Gamma Ray Neutron Log: Gamma ray is a measurement of the natural radioactivity of a formation. Neutron log is used for delineation of porous formations. Data are used to identify the formations in the earth.

Groundbed: One or more anodes installed below the earth's surface for the purpose of supplying cathodic protection.

Impressed Current: An electric current supplied by a device employing a power source that is external to the electrode system. (An example is direct current for cathodic protection.)

Instant-Off Potential: The polarized half-cell potential of an electrode taken immediately after the cathodic protection current is stopped, which closely approximates the potential without IR drop (i.e., the polarized potential) when the current was on.

Interference Bond: An intentional metallic connection, between metallic systems in contact with a common electrolyte, designed to control electrical current interchange between the systems.

Intermediate Casing: A string of casing set to protect a section of hole and to allow drilling to continue to a greater depth. Also called protection casing string.

IR Drop: The voltage across a resistance in accordance with Ohm's law.

Isolation: See *Electrical Isolation*.

Lithology: Rock formations traversed by well casing.

Long-Line Current: Current through the earth between an anodic and a cathodic area that returns along an underground metallic structure.

Mutual Interference: An electrical DC interference on a well originating from within the cathodic protection system of several wells and structures, such as several DC power sources for a group of wells.

Native State Potential: The potential with zero groundbed current.

Negative Return: A point of connection between the cathodic protection negative cable and the protected structure.

Ohm: A resistance that passes one ampere of current when a one-volt potential is applied.

Packaged Anode: An anode that, when supplied, is already surrounded by a selected conductive backfill material.

Photovoltaic: Generation of an electromotive force when radiant energy falls on the boundary between two dissimilar materials.

Pipe-to-Soil Potential: See *Structure-to-Electrolyte Potential*.

Polarization: The change from the open-circuit potential as a result of current across the electrode/electrolyte interface. In this standard, polarization is considered to be the change of potential of a metal surface resulting from current to or from an electrolyte.

Potential Profile Log: See *Casing Potential Profile*.

Production Casing: Casing that extends through the surface and intermediate casings, sometimes only to the tip of the zone but almost always through the producing or storing zone.

Rectifier: A device to convert AC power to DC power.

Reference Electrode: An electrode whose open-circuit potential is constant under similar conditions of measurement, which is used for measuring the relative potentials of other electrodes.

Resistivity: (1) The resistance per unit length of a substance with uniform cross section. (2) A measure of the ability of an electrolyte (e.g., soil) to resist the flow of electric charge (e.g., cathodic protection current). Resistivity data are used to design a groundbed for a cathodic protection system.

Right-of-Way: Right of passage, as over another's property.

Self-Interference: See *Mutual Interference*.

Shunt: A precise resistor with known resistance in an electrical circuit used to measure a voltage (IR) drop, which is used to calculate the amount of current in amperes.

Soil Resistivity: A measure of the ability of a soil or formation to conduct electricity expressed in units of ohm-centimeters or ohm-meters. Data are used to design a groundbed for a cathodic protection system.

Structure-to-Electrolyte Potential: The potential difference between the surface of a buried or submerged metallic structure and the electrolyte that is measured with reference to an electrode in contact with the electrolyte.

Structure-to-Structure Potential: The potential difference between metallic structures, or sections of the same structure, in a common electrolyte.

Surface Casing: A casing string extending from the surface to a depth great enough to keep surface waters and loose earth from entering the well.

Surface Groundbed: One or more anodes installed below the earth's surface for the purpose of supplying cathodic protection less than 15 m (50 ft) in depth for the anodes.

Tafel Plot, Tafel Diagram, Tafel Line: A plot of the relationship between the change in potential (E) and the logarithm of the current density (log *i*) of an electrode when it is polarized in both the anodic and cathodic directions from its open-circuit potential.

Tafel Segment: That portion of the Tafel plot that appears as a straight line when current is plotted on the logarithmic scale and potential change is plotted on the linear scale. The beginning of the Tafel segment is that point on the curve at which the current-potential relationship follows the straight line with increasing current increments and deviates from the straight line with decreasing current increments.

Tafel Slope: The slope of the straight-line portion of the E log *i* curve on a Tafel plot. (The straight-line portion usually occurs at more than 50 mV from the open-circuit potential.)

Test Wire: An insulated wire attached to a structure (usually buried) such as a pipeline and brought to a terminal convenient for making electrical tests to evaluate cathodic protection.

Tubing: A pipe inside the production casing through which oil is pumped, or liquid is removed from the natural gas storage zone.

Union (Isolating): See *Electrical Isolation*.

Voltage: An electromotive force, or a difference in electrode potentials expressed in volts.

Well: A steel-cased hole associated with the production and storage of oil or gas.

Wellbore *(also called bore hole)*: A hole drilled into the earth for the installation of a deep groundbed system.

Wellhead: Valves and other aboveground fittings electrically connected to the production, surface, and intermediate casings. May be called a "christmas tree" when referring to oil and natural gas production and storage wells.

Well Casing: See *Production Casing*, *Intermediate Casing*, and *Surface Casing*.

Section 3: Determination of Need for CP

3.1 Introduction

3.1.1 The purpose of this section is to indicate those factors that should be considered in determining whether a well casing requires CP.

3.1.2 Metallic structures in contact with soil or submerged under water are subject to corrosion. Adequate procedures should be adopted to ensure that corrosion is not affecting safe and economical operation of well casings.

3.2 The decisions governing the need for CP of well casings shall be based on data obtained from corrosion surveys, operating records, prior tests with similar systems in similar environments, and on a study of design specifications and engineering, operating, and economic requirements.

3.2.1 The usual procedures for predicting the probability and rate of corrosion of a particular metallic casing system are as follows:

(a) The corrosion history of the well casing in question or of other systems of the same material in the same general area or in similar environments should be studied. The history should include cumulative leak frequency and downhole data obtained from workover (reconditioning) records.

(b) The environment surrounding a well casing should be studied. Once the nature of the environment has been determined, the probable corrosiveness can be estimated by referring to actual corrosion experience on similar well casings in similar environmental conditions. It should be remembered that formation water changes caused by production or injection methods may be contributing factors. One source of environmental data is the formation resistivity logs run on wells being investigated and on surrounding wells.

(c) The casing should be mechanically or electrically inspected for evidence of corrosion. The condition of the casing system should be carefully determined and recorded. (See nonmandatory Appendix C.)

(d) The casing should be inspected to determine whether there are any anodic areas. A well casing potential profile tool is commonly used for these investigations. (See nonmandatory Appendix A.)

(e) Maintenance records detailing leak locations and wall thickness surveys, which can be used as a guide for locating areas of maximum corrosion, should be reviewed.

(f) Statistical treatments of available leak data should be considered.

(g) The results of pressure testing should be reviewed; under certain conditions, this may help determine whether corrosion has occurred.

(h) When the well casing is pulled, it should be visually inspected.

(i) Close communication should be maintained with those responsible for the workover of a well.

3.2.2 Environmental and physical factors governing the need for CP are as follows:

3.2.2.1 The nature or constituents of the product being produced or stored.

3.2.2.2 Location of the well casing system in a sparsely or densely populated area and the frequency of visits by personnel.

3.2.2.3 Location of the well casing system as related to other facilities.

3.2.2.4 Influence of DC sources foreign to the system.

3.2.2.5 The introduction of secondary or tertiary recovery systems, which can sometimes increase corrosion rates on the backside of a well casing.

3.2.3 Economic factors

3.2.3.1 Costs of maintaining the well casing in service for its expected life may include repairing corrosion leaks, reconditioning, or replacing all or portions of the system.

3.2.3.2 In addition to the direct costs that result from corrosion, contingent costs may be incurred. The more common types of contingent costs are:

(a) Public liability claims.

(b) Property damage claims.

(c) Damage to natural facilities, such as municipal or irrigation water supplies, forests, parks, and scenic areas.

(d) Cost of cleanup of product lost to surroundings.

(e) Cost of individual casing workover(s) as related to corrosion leak(s).

(f) Plant shutdown and start-up costs.

(g) Loss of deliverability because of possible permanent formation damage caused by casing leak(s).

(h) Cost of lost product.

(i) Loss of revenue through interruption of service.

(j) Loss of contracts or good will through interruption of service.

(k) Loss of reclamation or salvage value of well casing.

(l) Loss of well casing, rendering well unusable for production or injection purposes.

3.2.3.3 The usual costs for protecting well casings are the costs of installing and operating CP. Other corrosion control costs may include:

(a) Inhibitors and bactericides used in drilling fluids.

(b) Corrosion-resistant materials.

(c) Cement for zones known to be corrosive.

(d) Electrical isolation to limit possible foreign current discharge from casings and to ensure that CP currents are applied to the well casing.

(e) Dielectric coating on the outer surface of casing.

Section 4: Criterion for CP and Current Requirements

4.1 Introduction

4.1.1 The determination of design current requirements depends, in part, on prior experience with similar structures or environments in which the method has been used successfully. The first-time user is strongly urged to consult a person experienced in well casing CP before finalizing a design.

4.1.2 Certain methods have been developed through laboratory experiment, or have been derived empirically by evaluating data from successful CP systems. These methods are presented in Paragraph 4.3 and can be used to assist with the design process; they are not intended to be a comprehensive or limiting list.

4.2 Criterion for CP

4.2.1 The CP current applied to the well casing shall be considered adequate when measurements indicate that a net flow of current to the casing has eliminated all anodic areas.

4.3 Methods of Determining Design Current Requirements

4.3.1 A profile tool is a device used to measure a voltage (IR) drop across a portion of well casing in service by electrically isolating two sets of contacts from each other. The voltage readings are used to indicate the magnitude and direction of the current flow in the casing. Details of the test method and interpretation of the data are given in Appendix A.

4.3.2 Average current density (mA/m^2) may be used to calculate the quantity of CP current required to prevent external corrosion. The current density used should be dictated by the downhole completion practice and formations (e.g., cementing practices, formation resistivities, water salinity, etc.) encountered in a given well. Current densities usually vary from 10 to 200 mA/m^2.

4.3.3 Mathematical modeling may also be used to determine design current requirements. The effect of applied CP current downhole can be calculated from electrical measurements at the wellhead. The applied voltage and current distribution can be calculated as a function of well depth. Usually, a downhole potential criterion is established as the accepted indication of protection. Several calculation methods are available, and others are being developed.

4.3.3.1 One method of mathematical modeling uses a modified attenuation equation. The native state potential is measured and recorded. It also requires well casing data and current drain measurements made after polarization of the well.

4.3.3.2 Another method uses formation resistivity data to establish a potential attenuation curve for a casing to which CP has been applied.

4.3.3.3 A third method models the well casing by a computerized equivalent electrical circuit incorporating resistivity profiles, nonlinear polarization characteristics, and the well casing data.

4.3.4 E-log-I method

4.3.4.1 The principle behind the E-log-I method is that when current is impressed through the earth onto a metallic well casing, the potential between the well casing and reference electrode is shifted.

SED_RT_0036

The potential shift for a given current level depends on the following factors:

(a) The length of time the current is applied.

(b) Current density, which is affected by factors such as well depth, casing sizes, and cement.

(c) Properties of the electrolyte.

4.3.4.2 As increasing levels of current are impressed, polarization begins on the surface of the casing. The E-log-I data are plotted to enable selection of a current level at which polarization begins. (Details of the test method and interpretation of the data are given in Appendix B.)

4.4 Methods of Evaluating Effectiveness

4.4.1 A combination of procedures is always advised for evaluating the effectiveness of CP.

Bibliography for Section 4

Ballou, J.K., F.W. Schremp. "Cathodic Protection of Oil Well Casings at Kettleman Hills, California." Corrosion 13, 8 (1957): pp. 507-514.

Bates, R.D., B.W. Bradley. "Cathodic Protection of Oil Well Casings." Materials Protection 5, 7 (1966): pp. 33-35.

Battle, J.L. "Corrosion of Casing in Oil and Gas Wells." Corrosion 9, 9 (1953): pp. 313-320.

Blount, F.E., P.W. Bolmer. "Feasibility Studies of Cathodic Protection of Deep Well External Casing Surfaces." Materials Protection 1, 8 (1962): pp. 10-23.

Dabkowski, J. "Assessing the Cathodic Protection Levels of Well Casings." Final Report PRCI Project, 1983, pp. 106-151.

Dabkowski, J. "Monitoring Cathodic Protection of Well Casings." American Gas Association Conference Proceedings, Operating Section, held May 5-7, 1980. Salt Lake City, UT: AGA, 1980, p. T-411.

Doremus, E.P., F.B. Thorn. "Cathodic Protection Stops Casing Corrosion in Fullerton Field." Oil & Gas Journal 67, 31 (1969): pp. 123-124, 127-128.

Hamlin, A.W. "Cathodic Protection of Gas Storage Wells." West Virginia University Technical Bulletin No. 11-1, 1979, pp. 157-161.

Haycock, E.W. "Current Requirement for Cathodic Protection of Well Casing." Corrosion 13, 11 (1957): pp. 767-773.

Heinrichs, H.J., W.O. Ingram, B.G. Schellenberger. "Cathodic Protection Requirements for Well Casings." Journal of Canadian Petroleum Technology 17, 3 (1978): pp. 54-61.

Hodge, R.E. "Cathodic Protection of Natural Gas Storage Wells." Gas 44, 3 (1968): pp. 63-66.

Husock, B. "Methods for Determining Current Requirements for Cathodic Protection of Well Casings—A Review." Materials Performance 23, 1 (1984): pp. 39-44.

Ingram W.O., B.G. Schellenberger. "Deep Well Casing Cathodic Protection Requirements." Journal of Canadian Petroleum Technology 18, 2 (1979): pp. 39-43.

Kirklen, C.A. "Effectiveness of Well Casing Cathodic Protection." Journal of Petroleum Technology 28 (1974): pp. 724-730.

Pace, F.A., S.E. Krupick. "Reduction of Leaks by Using Cathodic Protection—East Texas Field." Journal of Petroleum Technology 34, 7 (1982): pp. 1437-1442.

Paver, E.C. "Cathodic Protection of Storage Well Casings." Gas Age 32, 12 (1965): pp. 22-27.

Phillips, C.S. "External Protection of Well Casings." West Virginia University Technical Bulletin No. 113, 1974, pp. 581-588.

Riordan, M.A., R.P. Steck. "Well Casing as an Electrochemical Network in Cathodic Protection Design." Materials Protection 2, 7 (1963): p. 58.

Roberson, G.R., F.W. Schremp. "Optimizing the Distribution of Cathodic Protection Current." Journal of Petroleum Technology 22, 7 (1970): pp. 812-816.

Schremp, F.W. "Cathodic Protection of Well Casings Offshore." Journal of Petroleum Technology 34, 8 (1982): p. 1863.

Schremp, F.W., L.E. Newton. "Use of Wellhead Electrical Measurements to Calculate Bottomhole Cathodic Protection of Well Casings." CORROSION/79, paper No. 63. Houston, TX: NACE International, 1979.

Titterington, Y.W. "Cathodic Protection of Well Casing." West Virginia University Technical Bulletin No. 48, 1957, pp. 302-312.

Toncre, A.C. "Cathodic Protection of Well Casings in Saudi Arabia." Metallic Corrosion 7 (1981): pp. 6-11.

Unz, M. "Cathodic Protection of Borehole Casing." Materials Performance 14, 10 (1975): pp. 40-47.

Section 5: Design of CP Systems for Well Casings

5.1 Introduction

5.1.1 This section presents recommended procedures for designing CP systems that effectively control corrosion of well casings in contact with the earth. The design should satisfy the criterion in Section 4 and be reliable for the intended operating life of the system.

5.1.2 CP for pipelines is considered separately from well protection when applicable.

5.2 Objectives of CP System Design

5.2.1 Enable application of sufficient protective current to the well casings to meet the criterion for CP.

5.2.2 Minimize the stray current to foreign underground structures. (See Section 7.)

5.2.3 Design a groundbed with a lifetime that is commensurate with the required life of the protected structure.

5.2.4 Provide for periodic maintenance of the groundbed.

5.2.5 Provide a power source and groundbed with sufficient capacity to include connecting pipelines and other structures as required.

5.3 Considerations in the Design of CP Systems

5.3.1 CP applied to the well casings and the connecting pipelines and structures may be a source of mutual interference. (Refer to Section 7.)

5.3.2 Electrical grounding procedure requirements should be considered in the CP design.

5.3.3 In designing a CP system for well casings, the following should be considered:

5.3.3.1 Availability of AC power should be determined.

5.3.3.2 The proposed installation site should be investigated for any hazardous conditions.

5.3.3.3 The AC power source for the CP rectifier should be a suitable distance from the well structure to ensure a safe working area.

5.3.3.4 Materials and installation practices that conform to applicable codes (e.g., National Electrical Manufacturers Association [NEMA][(2)] Standards, National Electrical Code [NEC],[(3)] and practices of NACE International) should be specified.

5.3.3.5 The CP system should be selected and designed for optimum economies of installation, maintenance, and operation.

5.3.3.6 Materials and installation practices that ensure safe and dependable operation throughout the intended service life of the CP system should be specified.

5.3.3.7 A system for optimum currents should be selected. Excessive current can be detrimental to buried or submerged metallic structures.

5.3.3.8 The current requirement data for pipelines connected to wells should be studied so that the groundbeds may be placed in the proper locations. This allows appropriate distribution of current to wells and pipelines.

5.3.3.9 Electrical interference from foreign sources should be investigated and the results included as a design consideration. (See Section 7.)

5.4 Considerations Influencing Location of Anodes

5.4.1 The anode that will be closest to a well should be placed at a distance determined by testing or accepted empirical means.

5.4.2 Plans for long- and short-term additions or changes in buried physical structures.

5.4.3 Location of pipelines connected to wells.

(2) National Electrical Manufacturers Association (NEMA), 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209.
(3) National Electrical Code (NEC), National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.

5.4.4 Pipelines used as a negative return and those electrically isolated.

5.4.5 Soil resistivity.

5.4.6 Use of surface or deep vertical type of groundbed.

5.4.7 Location of foreign structures.

5.4.8 Placement where likelihood of physical disturbance or damage is minimal.

5.5 Types of CP Systems for Well Casings

5.5.1 Impressed current system

5.5.1.1 Surface groundbed

5.5.1.2 Deep groundbed

5.5.2 Galvanic anode system

5.6 Considerations in the Selection of the Type of CP System

5.6.1 Current requirements

5.6.1.1 The total casing surface area to receive CP, including surface casings and that portion of intermediate and production casing that is to receive protection.

5.6.2 Soil resistivity

5.6.2.1 Resistivity and installation space availability influence the choice of a surface or deep groundbed installation. High-resistivity formations that restrict the flow of current to the casing may necessitate placement of anodes below such formations.

5.6.2.1.1 Resistivity to a 15-m (50-ft) depth for a surface groundbed may be determined by surface measurements or experience.

5.6.2.1.2 Resistivity for depths greater than 15 m (50 ft) for a deep groundbed may be determined by surface measurement, formation resistivity log, or experience.

5.6.3 Future drilling of wells in the area of CP influence.

5.6.4 Future development of the right-of-way area and extensions to the pipeline system connected to wells jointly protected by the same power source and groundbed.

5.6.5 The cost of installation, operation, and maintenance.

5.6.6 Physical space available and condition of land surface for ease of facility installation, ingress, and egress.

5.6.7 Proximity of foreign structures.

5.6.8 Ability to procure easement.

5.6.9 Interference effect.

5.6.10 Power source availability.

5.7 Factors Determining Anode Current Output, Operating Life, and Efficiency

5.7.1 Various anode materials have different rates of deterioration when discharging a given current density from the anode surface in a specific environment. For a given current output, the anode life depends on the anode and backfill materials and the number of anodes in the CP system. Anode performance data may be used to calculate the probable deterioration rate.

5.7.2 The resistance to electrolyte of the anode system may be calculated from available data. Formulas and graphs relating to these factors are available.

5.7.3 The use of a special backfill material with impressed current anodes lengthens their useful life and reduces the effective anode-to-earth electrical resistance. The most common backfill materials are metallurgical coke, calcined petroleum coke, and natural or manufactured graphite.

5.7.4 Entrapment of gas generated by the anodic reaction can impair the ability of the impressed current groundbed to deliver the required current. Suitable provision should be made for venting the anodes, particularly in a deep groundbed. Increasing the number of anodes may reduce gas blockage by reducing current discharge from each anode.

5.7.5 Electroosmotic effects could impair the ability of the impressed current groundbed to deliver the required current. Suitable provisions should be made to ensure adequate moisture around the anodes. Increasing the number of impressed current anodes may reduce electroosmotic effects.

5.7.6 Special applications such as deep groundbeds require careful selection of cables and wires. Refer to NACE SP0572.[1]

5.8 Impressed Current System Design Considerations

5.8.1 Groundbed location and total current required should be determined.

5.8.2 A deep groundbed may be used when lithology prevents equitable distribution of current to the total depth of the well casing. Placing anodes in relatively low-resistivity shallow formations compared with deeper formations may concentrate excessive current on upper portions of the well casing and deprive the deeper portions of sufficient current. Refer to NACE SP0572.

5.8.3 Placement of groundbeds too close to a well casing may prevent flow of sufficient current to a lower depth. Increasing total current may create interference with other wells and structures.

5.8.4 The performance of vertically or horizontally placed anodes can be affected by their spacing. In a soil of a given resistivity, the output of an impressed current groundbed may be improved by increasing the space between anodes, assuming the additional cable resistance is considered.

5.8.5 DC power sources that can be used:

5.8.5.1 Rectifier units to convert AC to DC power.

5.8.5.2 Thermoelectric generators.

5.8.5.3 Photovoltaic power systems.

5.8.5.4 Wind- or power-driven generators or alternators with rectification.

5.9 Galvanic Anode System Design Considerations

5.9.1 Galvanic anodes have limited use for CP of well casings.

5.10 Design Factors in Applying CP to More than One Well

5.10.1 Several wells may be cathodically protected as a group. When applying CP, the wells should be treated as a unit, along with associated pipelines or structures, using one or more power sources and groundbeds. Care must be taken to ensure adequate current distribution throughout the length of each well.

5.10.1.1 Well casings in a group may vary in length.

5.10.1.2 Well spacing may vary.

5.10.1.3 Intermediate casings may vary in length.

5.10.1.4 Wells with identical completion procedures and equal lengths of casing may have different current requirements.

5.10.2 The current requirements and electrical resistances of any connecting pipeline, when used as a negative return to a rectifier, can limit the amount of current reaching the well casings.

5.10.3 If detrimental electrical interference is encountered, each CP system must be designed to counteract the effects.

5.10.4 CP design varies regarding the physical field parameters. The most effective design considers:

5.10.4.1 Total amount of current required for casings and other structures.

5.10.4.2 Soil resistivity for installation of anodes.

5.10.4.3 Location of well casing with respect to pipelines and other structures.

5.10.4.4 The individual current demand of each well.

5.10.5 Typical CP design options

5.10.5.1 One DC power source and one groundbed for one or several wells.

5.10.5.2 One DC power source and more than one groundbed for several wells.

5.10.5.3 More than one DC power source and one groundbed for several wells.

5.10.6 Perimeter or isolated wells may require a separate CP system.

Bibliography for Section 5

Diffenderfer, R.B. "Cathodic Protection System Design." West Virginia University Technical Bulletin No. 4-1, 1976, pp. 593-603.

Doniquian, T.M. "Pulse Rectifier." Oil & Gas Journal (July 1982): pp. 221-229.

Dwight, H.B. "Calculations of Resistance to Ground." Electrical Engineering 55 (1936): pp. 1319-1328. Also in Materials Performance 22, 4 (1983): pp. 23-33.

NACE Publication 2B160. "Use of High Silicon Cast Iron for Anodes." Houston, TX: NACE International, 1960.

NACE Publication TPC 5. Corrosion Control in Petroleum Production. Houston, TX: NACE International, 1979, pp. 53-65.

Parker, M.E., E.G. Peatlie. Pipeline Corrosion and Cathodic Protection—A Field Manual. Houston, TX: Gulf Publishing Company, 1984, pp. 59-77.

Peabody, A.W. Control of Pipeline Corrosion. Houston, TX: NACE International, 1967, pp. 94-104, 116-119.

Tefankjian, D.A. "Application of Cathodic Protection." West Virginia University Technical Bulletin No. 6-3, 1975, pp. 131-147.

Section 6: Installation of CP Systems

6.1 Introduction

6.1.1 This section presents recommended procedures for installation of CP systems that achieve protection of the well casing structures when design considerations recommended in Section 5 and Appendix D have been followed.

6.2 Construction Specifications

6.2.1 All construction work performed on CP systems shall be done in accordance with construction drawings and specifications. The construction specifications shall be in accordance with recommended practices in Section 5 and nonmandatory Appendix D.

6.3 Construction Supervision

6.3.1 All construction work performed on CP systems shall be under the supervision of a trained and qualified inspector. It shall be the inspector's function to verify that the installation is made in strict accordance with the drawings and specifications, or that exceptions are made only with the express consent of qualified personnel, when it can be demonstrated that the effectiveness of the system is not impaired. It should also be the inspector's function to verify that construction methods and techniques are in accordance with good practices.

6.3.2 All deviations from construction specifications shall be noted on as-built drawings.

6.4 Galvanic Anodes

6.4.1 Inspection and handling

6.4.1.1 Packaged anodes shall be inspected and steps taken to ensure that the backfill material completely surrounds the anode. The individual container for the backfill material and anode should be intact. If individually packed anodes are supplied in waterproof containers, the containers should be removed before installation. Packaged anodes should be kept dry during storage.

6.4.1.2 The lead wire must be securely connected to the anode. The lead wire should be inspected to ensure that it is not damaged. Care should be taken to avoid damage to insulation and kinking of the lead wire.

6.5 Impressed Current Systems

6.5.1 Inspection and handling

6.5.1.1 The rectifier or other power source shall be inspected to ensure that internal connections are mechanically secure and that no damage is apparent. Rating of the direct current source output should comply with construction specifications. Care should be exercised in handling and installation.

6.5.1.2 Impressed current anodes shall be inspected for conformity to specified anode material and size and length of lead wire, and to ensure that the cap, if used, is secure. Care should be exercised to avoid cracking or damaging anodes during handling and installation.

6.5.1.3 The lead wire shall be inspected carefully for defects in insulation (e.g., cracks, abrasions, or excessive thinning below specified thickness). Care should be taken to avoid damage to insulation in the wire. Defects in the lead wire must be repaired or the anode/wire unit must be rejected.

6.5.1.4 Anode backfill material shall conform to specifications.

6.5.2 Installation provisions

6.5.2.1 The rectifier or other power source should be installed so that the possibility of damage or vandalism is minimized.

6.5.2.2 Wiring to rectifiers shall comply with all local and national electrical codes and requirements of the utility supplying power. An external disconnect switch on AC wiring shall be provided. The rectifier case shall be grounded adequately.

6.5.2.3 Impressed current power supplies should be designed to prevent reverse current flow when the unit is not operational.

6.5.2.4 Impressed current anodes should be installed vertically, horizontally, or in deep holes as indicated in the construction specifications. Backfill material, when specified, should be packed around the anodes, eliminating voids. Care shall be taken to avoid damage to the anode, wire, and wire connection to the anode during installation.

6.5.2.5 The conductor (negative lead wire) to the structure shall be connected as indicated in the specifications. Conductor connections to the power source must be mechanically secure and electrically conductive. Before the power source is energized, it must be verified that the negative conductor is connected to the structure and the positive conductor is connected to the anodes and to the power source output terminals. After the power source is energized, suitable electrical measurements shall be made to verify that these connections are correct.

6.5.2.6 Underground negative lead wire shall be effectively insulated. Bare or ineffectively insulated wire may require a substantial amount of the total protective current.

6.5.2.7 Underground splices on the positive lead cable to anodes shall be kept to a minimum. Connections between cable and conductor from each anode shall be mechanically secure and electrically conductive. If buried or submerged, these connections must be sealed to prevent moisture penetration so that electrical isolation is ensured. If the insulation integrity on the buried or submerged positive lead cable, including splices, is damaged, the cable may corrode and fail prematurely.

6.5.2.8 When specifications call for burial of the anode cable, care must be taken to avoid damage to the insulation. Sufficient slack shall be left in the cable to avoid strain on connections and anode leads caused by settling. Backfill materials used around cables should be free of rocks and foreign materials that might damage the wire insulation when installed in the trench. Cables may be installed by plowing if proper precautions are taken.

6.6 Corrosion Control Test Stations and Bonds

6.6.1 Refer to Section D.5 of Appendix D for design of corrosion control test stations and bonds.

6.7 Isolating the Wellhead from Pipelines and Other Structures

6.7.1 Refer to Section D.2 of Appendix D for design of electrical isolation.

Section 7: Control of Interference Currents

7.1 Introduction

7.1.1 This section presents recommended practices for the detection and mitigation of interference currents.The mechanisms and detrimental effects of interference currents are described.

7.2 Mechanism of Interference Current

7.2.1 Interference current corrosion on a well casing differs from electrochemical corrosion caused by other conditions. The source of the corrosion current is foreign or separate from the affected well. The foreign structure may be electrically bonded to or isolated from the affected well. Interfering currents may enter or leave the casing at several locations along the well casing. The damage from an interference current occurs in the area where the current leaves the well casing and enters the electrolyte.

7.2.2 The severity of interference resulting from stray electrical current depends on several factors:

7.2.2.1 Distance between wells.

7.2.2.2 Location of pipelines with respect to wells.

7.2.2.3 Location of interfering current source.

7.2.2.4 Depth of well casing.

7.2.2.5 Location of highly conductive earth formations.

7.2.2.6 Magnitude of potential gradient in the earth that the affected well penetrates. These gradients are created by current flowing to other structures.

7.2.2.7 Location of electric power line grounding system.

7.2.2.8 Quality and extent of the cementing program on the well casing.

7.2.3 Sources of interference currents:

7.2.3.1 Constant current—Sources that have essentially constant DC output are CP rectifiers, thermoelectric generators, photovoltaic and windmill battery units, etc.

7.2.3.2 Fluctuating current—Typical sources are DC electrified railway systems, mine hauling systems, pumps, welding machines, DC power systems, etc.

7.2.3.3 An interference current may originate in a foreign CP system on nearby wells or pipelines that are electrically isolated from the affected well.

7.2.3.4 Mutual interference current can result from CP applied to other wells in a metallically connected system that includes the affected well.

7.3 Detection of Interference Currents

7.3.1 During well casing CP surveys, personnel should look for electrical changes and facilities that may be a source of interference current.

7.3.1.1 A change in casing-to-electrolyte potential when foreign electrical sources are switched off and on is cause to investigate for downhole well casing interference.

7.3.1.2 Well casing current measurement and downhole well casing potential profiles should be used to assess the presence and magnitude of interference current.

7.3.1.3 The presence of external corrosion and perforation of well casing may be determined by using an electromagnetic thickness measurement tool to find changes in wall thickness.

7.3.2 When interference current is suspected, appropriate tests should be conducted to determine its presence and magnitude. All affected parties shall be notified before tests are performed. (Notification should be channeled through an Underground Corrosion Control Coordinating Committee, where one exists).[4] Any one or a combination of the following procedures can be used to determine the existence or extent of interference:

7.3.2.1 Casing potential changes shall, where practical, be measured with respect to a remote reference electrode. The reference electrode shall be placed beyond the earth gradient field of interfering current. The foreign direct current source should be turned on and off during the test.

7.3.2.2 Change in the magnitude of well casing current should be measured, and the direction of flow should be determined while performing a well casing potential profile. The foreign direct current source should be turned off and on during the test.

7.3.2.3 The variation in current output of the suspected source of interference current should be determined and compared with measurements obtained in Paragraphs 7.3.2.1 and 7.3.2.2. This may require correlation of data with time.

7.4 Methods for Resolving Interference Corrosion Problems

7.4.1 Each interference problem is unique and the solution should be mutually satisfactory to all parties involved.

7.4.2 Mutual interference between well casings may be minimized when wellheads within the electrically connected system are adjusted to equal potential with respect to a remote reference electrode.

7.4.3 The interfering current source should be removed or relocated.

7.4.4 The effect of interference current may be counteracted by adding CP to the affected well.

7.4.5 Mutual interference between wells in a common CP system may be reduced by providing an interference bond, with a current drain regulating device, from the wells to the rectifier.

7.4.5.1 An interference bond of proper resistance should be designed and installed.

7.4.5.2 A current regulating device should be installed in the rectifier cable connected to the wellhead.

7.4.5.3 The current discharge from interfering cathodic rectifiers should be adjusted to eliminate or decrease interference.

7.4.6 The CP groundbed should be relocated.

7.4.7 The design of the CP system should be modified when connecting pipelines (used as negative returns) require a high percentage of the total current for protecting the wells.

(4) Information on Underground Corrosion Control Coordinating Committees may be available from the Technical Activities Division, 1440 South Creek Drive, Houston, TX 77084-4906 (telephone: +1 281/228-6200). Underground Corrosion Control Coordinating Committees are asked to keep NACE International Headquarters informed of their activities, but records are more current on some of the groups than on others.

7.4.7.1 Rectifiers and groundbed with reduced current output per unit should be added.

7.4.7.2 The dielectric coating of connecting pipelines should be improved to reduce the total required current.

7.5 Methods to Indicate Resolution of Interference

7.5.1 A satisfactory downhole well casing potential profile log indicating current that is adequate to eliminate anodic areas on affected casing should be obtained.

7.5.2 Sufficient CP currents, interpreted from surface test data or empirical calculation, should be applied to affected well casing.

7.5.3 Interference current discharges should be neutralized as determined by applicable criteria.

Bibliography for Section 7

Gast, W.F. "Well Casing Interference and Potential Equalization Investigation." *Materials Performance* 13, 5 (1974): pp. 31-36.

Kilpatrick, J.M., L.V. Collings. "Use of Casing Potential Profile Test for Well Casing Interference Studies." API Production Division Southwestern District Spring Meeting, Reprint No. 906-12-L. Washington, DC: American Petroleum Institute (API), March 1967, p. 15.

Roberson, G.R. "Effect of Mutual Interference." *Materials Protection* 6, 3 (1967): p. 36.

Weeter, R.F., R.J. Chandler. "Mutual Interference Between Well Casings with Cathodic Protection." *Materials Performance* 13, 1 (1974): pp. 26-30.

Section 8: Operation and Maintenance of CP Systems

8.1 Introduction

8.1.1 The purpose of this section is to designate procedures and practices for energizing and maintaining continuous, effective, and efficient operation of CP systems.

8.1.1.1 Electrical measurements and inspections are necessary to determine that protection has been established according to the applicable criterion and that each part of the CP system is operating properly. Conditions that affect protection may change with time, however, and corresponding changes are required in the CP system to maintain protection. Periodic measurements and inspections shall be made to detect changes in the conditions that affect the CP system. Local conditions may exist in which operating experience indicates that surveys and inspections should be made more frequently than recommended herein.

8.1.1.2 Care should be exercised in selecting the location, number, and type of electrical measurements used to determine the adequacy of CP.

8.2 Tests shall be conducted after each CP system is energized to determine whether the system is satisfying the applicable criterion and is operating efficiently. Tests shall include one or more of the following types of measurements and must relate to the criterion established by this standard.

8.2.1 Casing-to-reference-electrode potential, as applicable.

8.2.2 Calculation technique to estimate CP effectiveness (refer to Paragraph 4.3.3).

8.2.3 Structure-to-structure potential.

8.2.4 Current flow.

8.2.5 Well casing potential profile (refer to Paragraph 4.3.1 and Appendix A).

8.3 Periodic tests are suggested to ensure the continuity of CP; the electrical measurements used in the tests may include one or more of the measurements listed in Paragraph 8.2.

8.4 Inspection and tests of CP facilities should be conducted as follows to ensure their proper operation and maintenance:

8.4.1 All sources of impressed current shall be checked at intervals not to exceed two months. Evidence of proper functioning may include the current output, normal power consumption, a visual or audible signal indicating normal operation, or the satisfactory electrical state of the protected casing.

8.4.2 All impressed current protective facilities should be inspected annually as part of a preventive maintenance program to minimize in-service failure. Inspections may include a check for electrical shorts, ground connections, meter accuracy, efficiency, and circuit resistance.

8.4.3 Reverse current switches, diodes, and inteference bonds, whose failure would jeopardize structure protection, shall be inspected for proper functioning at intervals not to exceed two months.

8.4.4 The effectiveness of electrical isolation fittings and continuity bonds shall be evaluated during periodic testing. This may be accomplished by on-site inspection or by evaluating corrosion test data.

8.5 The test equipment used for obtaining each electrical value shall be of an appropriate type. Instruments and related equipment shall be maintained in good operating condition and checked annually for accuracy.

8.6 Remedial measures shall be taken when periodic tests and inspections indicate that protection is no longer adequate according to applicable criteria. These measures may include:

8.6.1 Repair, replacement, or adjustment of components of CP systems.

8.6.2 Providing supplementary facilities when additional CP is necessary.

8.6.3 Repair, replacement, or adjustment of continuity and interference bonds.

8.6.4 Removal of accidental metallic contacts.

8.6.5 Repair of defective electrical isolation devices.

Section 9: Corrosion Control Records

9.1 Introduction

9.1.1 The purpose of this section is to describe corrosion control records that document in a clear, concise, workable manner the data pertinent to the design, installation, maintenance, and effectiveness of corrosion control measures for well casings.

9.2 Relative to determination of the need for corrosion control, the following should be recorded when applicable:

9.2.1 Information on corrosion leaks (e.g., date, well identity, location).

9.2.2 Electromagnetic casing thickness measurements.

9.2.3 Casing potential profile data.

9.2.4 Coating type applied to external surfaces of casings.

9.3 Relative to structure design, the following should be recorded:

9.3.1 Location and design of wellhead and associated electrical isolation devices.

9.3.2 Design and procedure for isolating or bonding any associated electrical power source grounding system.

9.3.3 Design and location of test leads, bond cables, and other test facilities.

9.3.4 Details of any other corrosion control measures taken.

.

9.4 Relative to the design of corrosion control facilities, the following should be recorded:

9.4.1 Results of current requirement tests and how the tests were performed.

9.4.2 Results of soil resistivity surveys at groundbed locations, and where the surveys were made with respect to other wells, pipelines, and structures.

9.4.3 Interference tests and design of interference bonds and drainage switch installations, including:

9.4.3.1 Location of interference source relative to location of wells and other structures.

9.4.3.2 Scheduling of interference tests, correspondence with coordinating committees, coordinating committee minutes, and direct communication with the concerned companies.

9.4.3.3 Record of interference tests conducted, including location of tests, name of company involved, and results.

9.5 Relative to the installation of corrosion control facilities, the following should be recorded:

9.5.1 Installation of CP facilities

9.5.1.1 Impressed current systems

(a) Location and date placed in service.

SED_RT_0045

(b) Type, size, depth, backfill, and spacing of anodes.

(c) Number of anodes.

(d) Location of groundbed anodes with respect to wells, pipelines, and other structures.

(e) Specifications of rectifier or other energy source.

(f) Type(s) and size(s) of buried cable.

9.5.1.2 Galvanic anode systems

(a) Location and date placed in service.

(b) Type, size, backfill, and spacing of anodes.

(c) Number of anodes.

9.5.2 Installation of interference bonds and drainage switches

9.5.2.1 Details of interference bond installation

(a) Locations and names of companies involved.

(b) Resistance value or other pertinent information.

(c) Magnitude and polarity of drainage current.

9.5.2.2 Details of drainage switch installation

(a) Locations and names of companies involved.

(b) Type of switch or equivalent device.

(c) Data showing effective operating adjustment.

9.5.2.3 Details of other remedial measures

9.6 Records of surveys, inspections, and tests set forth in Sections 4, 5, 7, and 8 should be maintained to demonstrate that applicable criteria for interference control and CP have been satisfied.

9.6.1 Current drained from the well casing should be recorded at intervals consistent with company requirements.

9.6.2 Other electrical measurements should be recorded as required to monitor the CP for each well and to satisfy the criterion for CP of the wells.

9.7 Relative to the maintenance of corrosion control facilities, the following information should be recorded:

9.7.1 Maintenance of CP facilities

9.7.1.1 Repair of rectifiers or other DC energy sources.

9.7.1.2 Repair or replacement of anodes, connections, and cable.

9.7.2 Maintenance of interference bonds and drainage switches

9.7.2.1 Repair of interference bonds.

9.7.2.2 Repair of drainage switches or equivalent devices.

9.7.3 Maintenance, repair, and replacement of electrical isolation devices, test leads, and other test facilities.

9.8 Records sufficient to demonstrate the evaluation of the need for and the effectiveness of corrosion control measures should be retained as long as the facility involved remains in service. Other related corrosion control records should be retained for a period that satisfies individual company needs.

References

1. NACE SP0572 (latest revision), "Design, Installation, Operation, and Maintenance of Impressed Current Deep Anode Beds" (Houston, TX: NACE).

2. F.W. Anney, "Electrical Resistivity of Oil-Country Tubular Steels," U.S. Steel Technical Report, March 31, 1971.

3. NACE SP0177 (latest revision), "Mitigation of Alternating Current and Lightning Effects on Metallic Structures and Corrosion Control Systems" (Houston, TX: NACE).

4. ANSI/ASME B31.8 (latest revision), "Gas Transmission and Distribution Piping Systems" (New York, NY: ANSI, and New York, NY: ASME).

5. NACE SP0169 (latest revision), "Control of External Corrosion on Underground or Submerged Metallic Piping Systems" (Houston, TX: NACE).

Appendix A—Casing Potential Profile (Nonmandatory)

A.1 Introduction

A.1.1 This appendix describes a typical potential profile tool, its function, and use. Procedures for interpreting data are covered. This appendix supplements Paragraph 4.3.1 of this standard.

A.1.2 The name "casing potential profile" has been widely accepted. The measurement is actually a potential difference, and the plotted data represent a casing potential difference profile. The tool measures a potential difference between two points on the casing as opposed to the potential of a pipe as measured in a pipe-to-soil potential in evaluating pipeline corrosion. The term *potential difference* is used interchangeably with voltage (IR) drop.

A.1.3 A casing potential profile should be performed under the direction of a person qualified by knowledge and experience in this particular endeavor.

A.2 Types of Casing Potential Profile Tools

A.2.1 A typical casing potential profile tool consists of two contacts positioned 3 to 8 m (10 to 26 ft) apart on tubing and separated by an electrical insulator. A wire is attached to each contact and brought to the surface to a voltmeter. The tool is moved along the inside of the casing to take voltage drop measurements as needed. (Refer to Figure A1.)

A.2.2 Some of the contact devices are:

A.2.2.1 Spring-loaded knives that continuously contact the casing while moving up or down. Tension is increased against the casing wall by manipulating the position of knives.

A.2.2.2 "Pipe cutter" wheels permanently tensioned on spreader arms. Wheels continuously ride the casing wall at constant pressure.

A.2.2.3 Spreader arms with contactors that are opened and closed by an electric motor or mechanical means from the ground level. Pressure against the casing wall is adjustable.

A.3 Effect of Electrical Resistance on Data

A.3.1 Variable circuit resistance affects voltage (IR) drop readings. Because the electrical resistance of steel casing is extremely low (in the µ-ohm per m range), the equipment design and procedure used to measure voltage are critical. For example, the voltage measured across approximately 6 m (20 ft) of casing can be in the range of 1 to 5,000 µV. The resistance portion of the electrical circuit consists of the following:

A.3.1.1 The well casing between the profile tool's upper and lower contacts.

A.3.1.2 Other permanent tool fittings and cable and connectors.

A.3.1.3 Contact of the knives to the casing wall at each setting.

A.3.2 Resistance tables for the various casing grades are available.[2] The resistance of the casing for a given API[(5)] grade changes as downhole temperature increases.

[(5)] American Petroleum Institute (API), 1220 L St. NW, Washington, DC 20005.

The resistance of the casing can be measured prior to installation.

A.3.3 A voltage (IR) drop measured across a given length of casing and total resistance can be used to calculate the current flow. The resistance value should be corrected for changes caused by temperature and grade of steel.

A.4 Other Influences on the Measured Voltage (IR) Drop

A.4.1 Thermal voltage differences between upper and lower contacts, casing wall, and knives. This is caused by the contacts riding continuously on the casing wall.

A.4.2 Resistance between contacts and casing wall. Foreign material on the casing wall can increase the total resistance and give an erroneous voltage (IR)

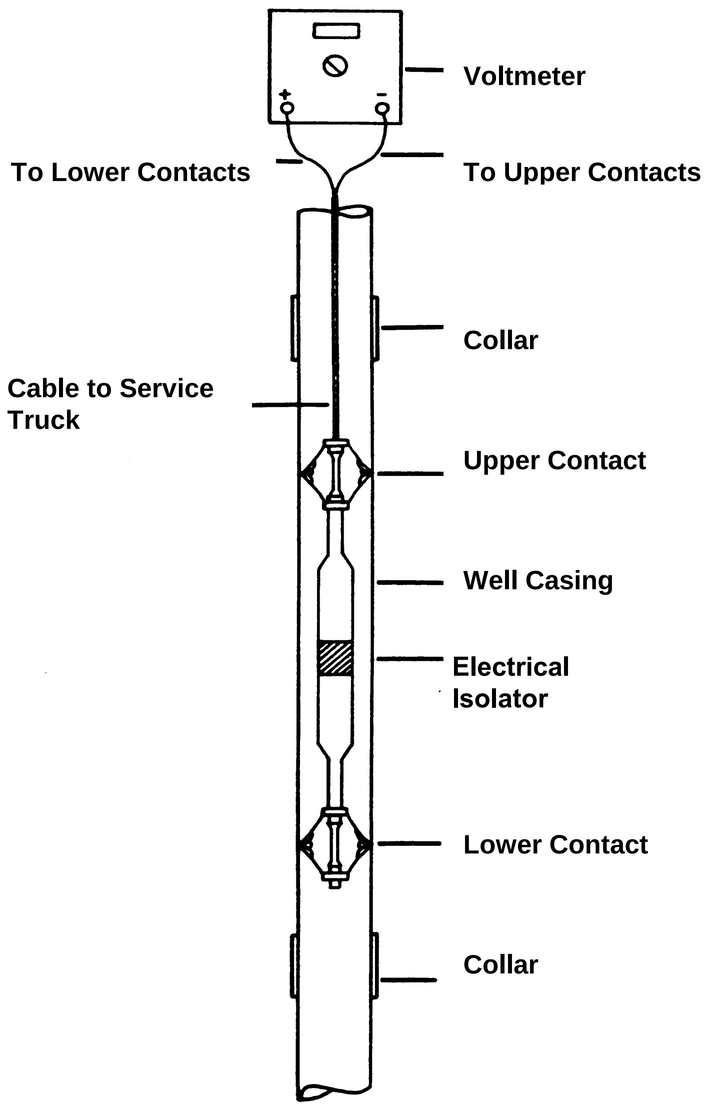


FIGURE A1—Casing Potential Profile Tool

drop reading. Some foreign materials commonly encountered are corrosion products, scale, petroleum deposits, corrosion inhibitors, and moisture.

A.4.3 Ineffective electrical insulation between upper and lower contacts.

A.4.4 Electrically conductive fluid in the casing and in contact with the tool.

A.5 Use of Instruments

A.5.1 Voltmeters with a high impedance and resolution of 1 µV and a short response time are required. They should also have AC rejection and be temperature compensated. Instruments should be calibrated annually.

A.5.2 The accepted procedure is to connect the positive (+) terminal of the voltmeter to the lower contact of the potential tool. A positive reading indicates current flowing up the casing (from positive to negative), and a negative reading indicates current flowing down the casing.

A.5.3 The tool is stopped at a given location in the well casing, and the IR drop readings are repeated, if required, until an acceptable one is obtained. An acceptable reading is one that is consistent with the log and other available data.

A.6 Data Use and Interpretation

A.6.1 A typical example of a casing potential profile plot is shown in Figure A2.

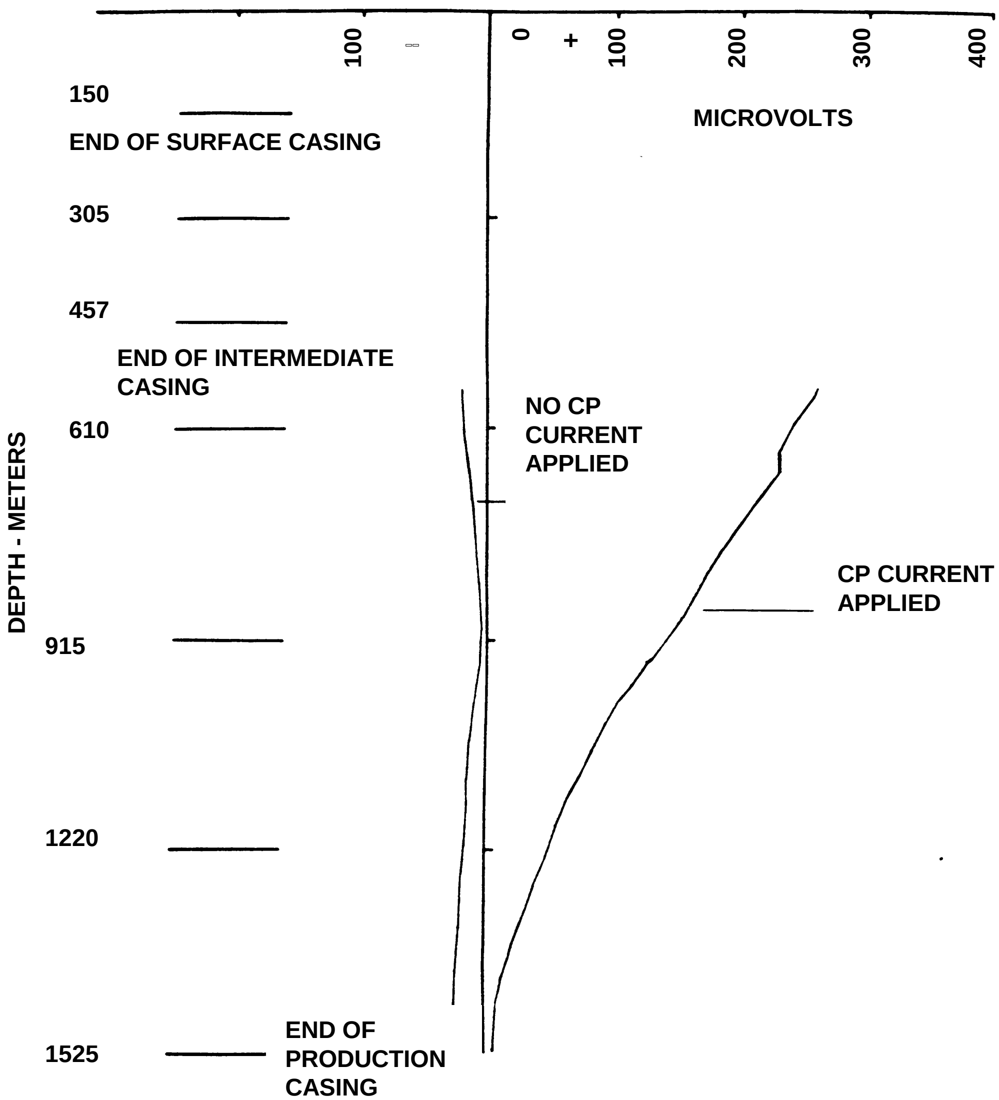


FIGURE A2—Typical Casing Potential Profile Plot

SED_RT_0049

A.6.2 Considerations in interpreting casing potential profile data:

A.6.2.1 Abrupt or inconsistent changes in single readings may indicate poor contact of the tool with the casing wall.

A.6.2.2 Data taken from a production casing shielded by other casing in the well are not necessarily indicative of current gain or discharge from the production casing to the formation.

A.6.2.3 A positive slope of the plotted voltage (IR) drop versus depth normally indicates an increase in the amount of current being picked up by the casing.

A.6.2.4 A negative slope of the voltage (IR) drop normally indicates a discharge of current from the casing.

A.6.2.5 Changes in slope are caused by a change in current or resistance. Resistance changes can be caused by:

(a) Change of wall thickness (e.g., corrosion, manufacturer's tolerance).

(b) Change of API pipe grade.

(c) The bridging of collars by the contacts of the tool.

A.6.2.6 Each voltage (IR) drop reading taken on a section of the casing (typically several meters) measures the long-line current. The local anodic cells are not detectable within the span of the tool. Current pickup is not necessarily uniform along the casing between tool contacts. Therefore, the current density at a given area on the casing may be greater or less than that indicated.

A.6.2.7 Casing potential profile data give a reasonable indication of the amount of current flowing and indicate a direction of current flow. The data cannot be interpreted to determine whether sufficient current is being applied to cancel all corrosion cells.

A.7 Well data for each well can assist in interpreting potential profile readings. These data may include the following:

A.7.1 API grade, diameter, length, and weight of casing joint and its location in the well.

A.7.2 Collar locator, used to facilitate positioning of a casing potential profile tool between collars.

A.7.3 Electromagnetic logs, which help determine changes in wall thickness and grade of casing, and allow evaluation of the inner wall surface condition.

A.7.4 Formation resistivity logs that identify strata that may alter current distribution.

A.7.5 Leak history and repair methods.

A.7.6 Other types of logs for a given well can aid in interpreting casing potential profile data. Refer to Paragraph D.7.4 of Appendix D.

A.8 Interference Testing with the Casing Potential Profile Tool

A.8.1 The casing potential profile tool is valuable when used to determine electrical DC interference. Data obtained pertain only to the conditions prevailing at the time of the test.

Appendix B—E-Log-I Test
(Nonmandatory)

B.1 Introduction

B.1.1 The purpose of this appendix is to outline the procedure for performing an E-log-I test and to give guidelines for interpretation of data. This appendix supplements Paragraph 4.3.4 of this standard.

B.2 General

B.2.1 An E-log-I test should be performed under the direction of a person qualified by knowledge of and experience in this particular endeavor.

B.3 Prerequisites to Performing an E-log-I Test

B.3.1 All buried metallic structures must be electrically isolated from the casing.

B.3.2 The temporary groundbed should be located at a sufficient distance from the well to give optimum current distribution along the well casing. When feasible, it should be placed where permanent bed location is anticipated.

B.3.3 Other buried metallic structures should be located.

B.3.4 Foreign rectifiers or other DC sources that could influence the test should be located.

B.3.5 The locations of high-resistivity strata that make it difficult to force current through underlying formations should be determined.

B.3.6 Placement of the reference electrode should be based on well depth, well spacing, and distance to foreign structures, and it should be beyond the influence of the test groundbed.

B.4 Test Procedure

B.4.1 After the equipment is set up (see Figure B1), the test should be conducted according to the following steps.

B.4.1.1 The "native state" potential, i.e., the potential with zero groundbed current, should be measured and recorded.

B.4.1.2 The test should then be begun by impressing current through the groundbed onto the well casing at the predetermined level (typically 0.1 A, as in Figure B2, for the selected time, typically two or three minutes).

B.4.1.3 At the end of the selected time, the current flow should be interrupted and the potential should be observed. Within a fraction of a second, the potential will drop abruptly. It will then begin a gradual "decay." The potential of interest is that just prior to the start of the decay. This is frequently referred to as the instant-off potential.

B.4.1.4 The current interruption should last no more than two seconds. A higher current should then be applied to the casing at the next predetermined current level. Typically, increments from 0.1 to 2.0 A are used.

B.4.1.5 The current increments should be selected to meet the requirements of individual conditions and to ensure the proper interpretation of the E-log-I test.

B.4.1.6 Time intervals should be consistent throughout the test.

B.5 Interpretation of Test Results

B.5.1 Figure B2 is an example of an E-log-I curve. Casing-electrolyte potentials and current applied are plotted on semilogarithmic scales. The interpretation of the curve is dependent on the experience of the operator. The current required is usually taken at the intersection, point A, or the first point lying on the Tafel segment, point B.

B.5.2 If the E-log-I results have not been verified for a given group of wells, additional testing such as the casing potential profile log should be conducted.

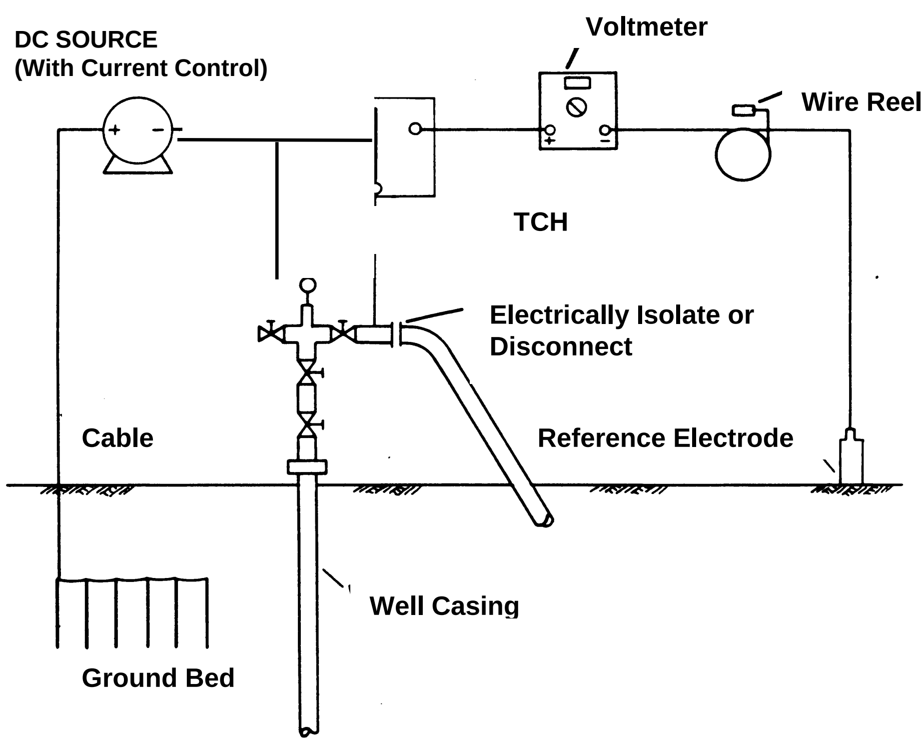


FIGURE B1—Equipment Set-Up for E-Log-I Test

SED_RT_0051

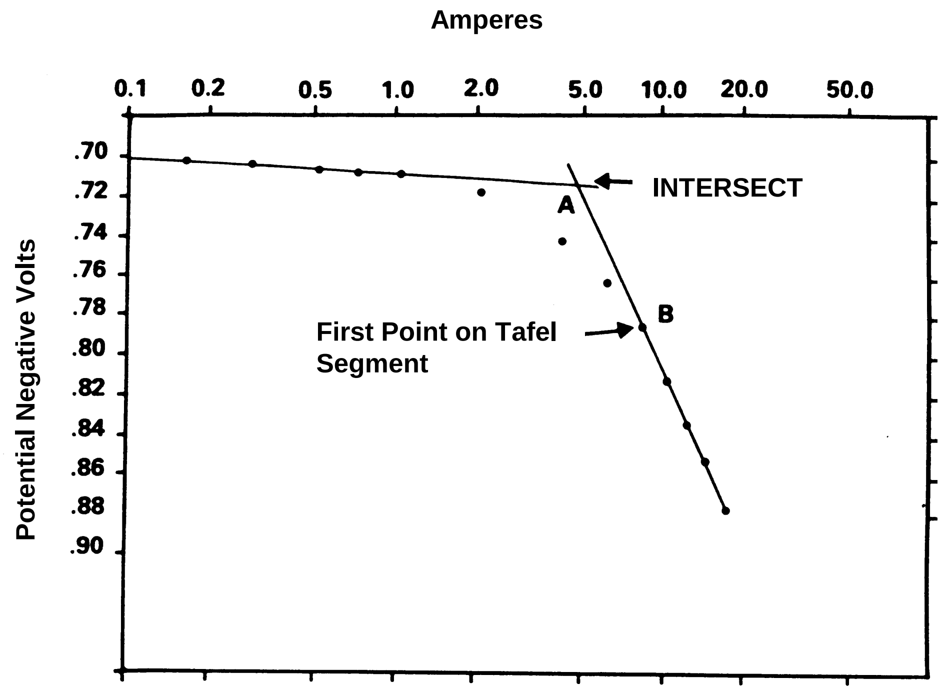


FIGURE B2—Sample E-Log-I Plot

Appendix C—Electromagnetic Casing Inspection Instruments (Nonmandatory)

C.1 Introduction

C.1.1 Subsurface electromagnetic inspection instruments are used to inspect the casing wall for defects. The inspection helps in determining a need to install a CP system or in determining its effectiveness after installation. These instruments fall into two broad categories; one induces an AC electromagnetic field into the casing wall and the other, a DC electromagnetic field into the casing wall. A comparison of these electromagnetic inspection instruments points out the differences in the methods of measurement and the significance of these differences.

C.2 Corrosion Inspection Instruments

C.2.1 The AC inspection instrument derives its signal by detecting the amount of phase shift measured between the low-frequency transmitter coil and the receiver coil. The transmitter coil is energized with a low-frequency AC current, causing an electromagnetic field to be induced into the casing. The field is detected by the receiver coil, usually located 300 to 600 mm (12 to 24 in.) away.

C.2.1.1 The amount of phase shift of the received signal from the transmitter is related to the properties of the casing. These properties are:

(a) Casing weight.

(b) Casing size.

(c) Casing grade, including permeability and conductivity.

(d) Metallic influence outside casing, if inspected casing is inside another casing (e.g., scratchers, centralizers).

C.2.1.2 The predominant response is a result of the change in the casing weight. Because there is an “averaging” effect between the transmitter and receiver coil, there must be significant metal loss (e.g., by corrosion) with respect to normal casing weight to cause a meaningful change in the phase shift.

C.2.1.3 The accuracy is such that a change from one API casing weight to another of the same size casing is detectable. It is responsive to the change in the amount of metal, whether the change is internal or external.

C.2.1.4 Supplementally, a noncontact electronic caliper is usually available for added internal information, and some instruments are also equipped with a set of closely spaced coils to provide uncalibrated indications of small defects.

C.2.2 The DC inspection instrument derives its casing defect signal by detecting a disturbance in an otherwise stable magnetic field within and surrounding the casing wall. The stable magnetic field is induced into the casing wall. A defect such as a corrosion pit causes a field irregularity or “flux leakage” at that point on both sides of the casing wall, whether the defect itself is on the inside or the outside wall of the casing. This disturbance can be created by a single pit, an isolated defect, or by a group of closely located pits, i.e., general corrosion. The instrument sensors detecting the field disturbances are small and are in contact (as close as possible) with the internal circumferential surface of the casing.

C.2.2.1 Signals emitted by these sensors are caused by changes in the field disturbances, which vary because of:

(a) The strength of the induced DC magnetic field.

(b) Defect depth.

(c) Defect shape.

(d) Metallic influence outside casing (e.g., scratchers, centralizers, another casing).

(e) Casing wall thickness.

(f) Casing size.

(g) Casing grade, including permeability and conductivity.

(h) The speed with which the sensor passes the defect.

C.2.2.2 Techniques currently in use utilize the amplitude of the sensor signal. Although casing wall thickness affects the signal amplitude, the sensor does not discern that thickness; the amplitude response is usually calibrated to indicate depth of defect penetration in percent of the total casing wall thickness.

C.2.2.3 Instrument sensitivity is normally limited to defect depths greater than 20% of the casing wall and defect areas greater than 32 mm (1.3 in.) in diameter. Accuracy of the corrosion defect measurement is approximately ±15% of defect depth in ideal single-string conditions when the casing information is known (e.g., weight, grade, etc.)

C.3 The information presented in Table C.1 may be used to determine which instrument is the most effective for certain situations.

C.3.1 Normally, operating conditions for both instruments are for temperatures up to 177°C (351°F), pressures of 100 MPa (14,500 psi), and casing sizes from 110- to 250-mm (4.3- to 9.8-in.) outside diameters. Some instruments can operate in conditions beyond these limits. The performance of either instrument is degraded when run in a multistring casing; however, the DC instrument’s operation is less affected.

C.3.2 The running of base logs as soon as possible is recommended for better evaluation of future data.

C.3.3 Clean casing walls result in more reliable inspections.

TABLE C.1—Instrument Effectiveness

Type of Instrument	Detects Casing Collars	Detects Small Defects and Defect Depths	Detects Large Holes in Casing	Detects Casing Weight Change	Detection of Outer Casing String	Detects Parted Casing String	Detects Drill Pipe Wear
AC	Yes	No	Yes	Yes	Yes	Yes	Yes
DC	Yes	Yes	Yes	No	No	Yes	No

Appendix D—Well Completion Design and Other Factors Associated with CP (Nonmandatory)

D.1 Introduction

D.1.1 The purpose of this appendix is to provide accepted corrosion control practices for the design of CP systems for oil production, natural gas production, and natural gas storage wells and associated aboveground facilities. A person qualified to practice corrosion control should be consulted during all phases of well design and installation (see Paragraph 1.5.) These recommendations should not be construed as taking precedence over recognized electrical safety practices. Electrical grounding procedures at the well surface must conform to local, state, and national codes.

D.2 Electrical Isolation

D.2.1 Isolating devices consisting of flange assemblies, prefabricated insulating joints, unions, and couplings should be installed to isolate the well production casing electrically from other wells, associated pipelines, gauge lines, and structures when required to facilitate the application of corrosion control. These devices should be properly rated for temperature, pressure, and dielectric strength. Installation of isolating devices should be avoided in enclosed areas where combustible atmospheres are likely to be present. Typical locations at which electrical insulating devices may be considered are as follows:

D.2.1.1 Where facilities change ownership, e.g., the wellhead.

D.2.1.2 At the junction of bare well casing and associated pipelines and facilities.

D.2.1.3 At the junction of dissimilar metals (to prevent galvanic corrosion).

D.2.2 Isolating devices

D.2.2.1 Inspection and electrical measurements should be performed to ensure that electrical isolation is adequate.

D.2.2.2 Buried isolating devices should be suitably coated or wrapped with insulating material to prevent electrical current transfer through the surrounding soil.

D.2.2.3 Additional or special isolating devices may be needed on pipelines containing conductive fluids.

D.2.3 The need for lightning and fault current protection at isolating devices should be considered. Cable connections from isolating devices to arrestors should be short, direct, and of a size suitable for short-term, high current loading.

D.2.4 When electrical contact would adversely affect CP, well casings should be electrically isolated from supporting pipe stanchions and structures.

D.2.5 When an isolating device is required, proper pressure-rated materials manufactured to perform this function should be used and installed according to manufacturer's recommendations.

D.2.6 As much distance as is practical should separate well casings, associated pipelines, and other facilities from electric transmission tower footings, ground cables, and counterpoise. Regardless of separation, consideration should always be given to lightning and fault current protection of well casings and safety of personnel. (See NACE SP0177.[3])

D.2.7 Plastic fittings used in chemical pump lines must meet electrical and physical requirements.

D.2.8 Isolation of high-temperature natural gas discharge and oil lines requires special design considerations for use of materials.

D.2.9 Nonmetallic isolators should meet specifications for use in buried and aboveground applications, as required.

D.3 Electrical Continuity

D.3.1 Consideration should be given to the electrical properties of screwed casing couplings. To ensure electrical continuity, low-electrical-resistance thread compounds should be used.

D.4 Coatings

D.4.1 A dielectric coating used on a well casing requires a surface that provides a good physical bond between it and the formation or cement to ensure a sealed environment. NOTE: Coatings used on well casings require special dielectric, physical, and chemical qualities, which are beyond the scope of this standard.

D.5 Corrosion Control Test Stations and Bonds

D.5.1 Test stations for potential and current measurements should be provided at the well to facilitate CP testing. Such use may include, but not be limited to, the following:

D.5.1.1 Well production casing.

D.5.1.2 Well surface and intermediate casings.

D.5.1.3 Dehydration, oil pumping, natural gas compressor, and other similar facilities.

D.5.1.4 Foreign metallic pipelines or facilities near the well.

D.5.1.5 Gauge lines.

D.5.2 Test leads should be color coded or otherwise permanently identified. Wire should be installed with slack. Damage to wire insulation should be avoided. Test leads should not be exposed to excessive sunlight. Aboveground test stations are preferred. If test stations are flush with the ground, adequate conductor slack should be provided within the test station to facilitate test connections.

D.5.3 An isolating device can be accommodated by attaching an appropriate test wire and low-resistance current-carrying cable to each side of the device. These cables and wires should be appropriately color coded or labeled and terminated at a convenient location for bonding when needed. Shunts may be used to measure current.

D.5.4 The test station may accommodate current-carrying cable when a pipeline is utilized as the negative return. Current-carrying cable or wire should not be used as a contact for taking casing-to-reference-electrode potentials.

D.5.5 Attachment of test leads and cables to steel well casings and equipment

D.5.5.1 Test leads are usually attached to an aboveground fitting, which is directly connected to the well casing. Soldering or thermit welding may be used to attach wire or cable when heating requirements do not exceed the temperature limit for casing and fittings. NOTE: Care should be taken to ensure that specified temperature limits are not exceeded during thermit welding to prevent damage to the pipe by copper penetration. Consult ANSI[(6)]/ASME[(7)] B31.8[4], Paragraph 862.115 on Electrical Connections and Monitoring Points, for additional guidelines on thermit welding. Mechanical connections to flanges and other fittings can be used if they remain secure and maintain low resistance. Refer to NACE SP0169.[5]

D.5.5.2 Attaching test wires directly to the production casing below ground level is beyond the scope of this standard. Special consideration must be given to requirements for cementing and completion procedures.

D.5.6 Coating of test wire attachments

D.5.6.1 All test lead wire and cable should be coated with a direct burial type of electrical isolating material. Attachments to fittings or casings should be coated with a dielectric material. The coating should be compatible with the existing coating on the fitting or casing.

D.6 CP

D.6.1 Refer to Sections 5 and 6 of this standard for the design and installation of CP.

D.7 Information Useful for the Design and Monitoring of a CP System

D.7.1 Well piping system specifications and practices.

D.7.1.1 Total length, size, weight, API grade, and location of each casing string in the well.

D.7.1.2 Electrical resistance of steel casing. Tables are available for various grades and temperatures.[(8)]

D.7.1.3 Coatings (dielectric)—well casings and connecting pipelines.

D.7.1.4 Cement types and grades, and locations of cemented intervals.

D.7.1.5 Drilling mud—type, inhibitor.

D.7.1.6 Additives to cement or mud.

D.7.1.7 Completion data regarding backfill around casing and the location of cement or other material.

D.7.1.8 Surface well fittings such as valves for access to casing.

D.7.1.9 Locations of metallic scratchers and centralizers.

D.7.1.10 Locations of metallic stress rings.

---

(6) American National Standards Institute (ANSI), 1819 L St., NW, Washington, DC 20036.

(7) ASME International (ASME), Three Park Avenue, New York, NY 10016-5990.

(8) Casing resistance data tables available from Manager, Casing Inspection Services, Dresser Atlas, Box 1407, Houston, TX 77251. Tables were based in part on data found in a U.S. Steel Technical Report.[2]

D.7.1.11 Acidizing procedures.

D.7.2 Well and associated pipeline site environments

D.7.2.1 Existing and proposed CP systems.

D.7.2.2 Possible interference sources (see Section 7 of this standard).

D.7.2.3 Surface environmental conditions.

D.7.2.4 Foreign buried metallic structures (including location, ownership, and corrosion control practices).

D.7.2.5 Site accessibility.

D.7.2.6 AC power availability.

D.7.2.7 Status of well's electrical isolation from foreign structures.

D.7.3 Field survey, corrosion test data, and operating experience

D.7.3.1 Electrical resistivity of the electrolyte (soil).

D.7.3.2 Electrical continuity (low resistance is required across well casing threaded couplings).

D.7.3.3 Cumulative leak history.

D.7.3.4 Interference current data.

D.7.4 Well logs used to supplement other test data utilized for design

D.7.4.1 Electromagnetic alternating current and direct current logs (thickness gauge).

D.7.4.2 Electric log—formation resistivity normally available from well completion data.

D.7.4.3 Gamma ray neutron log—determines relative lithology for location of high-resistivity formations.

D.7.4.4 Collar locator log—facilitates other logs such as casing potential profile.

D.7.4.5 Cement bond log or temperature log—indicates where cement is located between well casing and formation.

D.7.4.6 Optical inspection inside casing.

D.7.4.7 Caliper log (mechanical feelers) to determine internal wall thickness change or defects such as corrosion pits.

D.7.4.8 Dual induction resistivity log.

FORM 103 SUBMIT IN DUPLICATE

RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL AND GAS

History of Oil or Gas Well

OPERATOR Pacific Lighting Service Company FIELD Aliso Canyon

Well No. SFZU SS-25, Sec. 28, T. 3N, R. 16W, S.B. B. & M.

Date September 5, 19 73 Signed [signature]

P. O. Box 54790, Terminal Annex
Los Angeles, California 90054 (213) 689-3561 Title Agent
(Address) (Telephone Number) (President, Secretary or Agent)

It is of the greatest importance to have a complete history of the well. Use this form to report a full account of all important operations during the drilling and testing of the well or during re-drilling, altering of casing, plugging, or abandonment with the dates thereof. Be sure to include such items as hole size, formation test details, amounts of cement used, top and bottom of plugs, perforation details, sidetracked junk, bailing tests, shooting and initial production data.

Date
1973

5-24 Before moving in California Production Service rig, pumped 50 bbls. of oil heated to 250° into tubing to dewax the well. Rigged up and using McCullough, shot four 3/8" holes in tubing at 8485' with deflecting bullets. Pumped in one 60 bbl. batch of high gel polymer drilling fluid and obtained circulation with 400 bbls. of drilling fluid.

5-25 Circulated out gas and oil from well and bled off trap pressure. Removed X-mas tree and installed B.O.P., including hydril, complete shut-off and tubing rams. Pulled tubing and packer. Ran in hole with 4-5/8" bit and casing scraper.

5-26 Ran 4-5/8" bit and casing scraper and cleaned out bridges 8723'-8748', circulated hole clean recovering carbonate material from drilling fluid. Pulled out of hole and ran Dresser Atlas cement bond log and recorded 8737'-6950'. Ran neutron lifetime log and recorded 8742'-8000'.

5-27 Idle.

5-28 Ran Dresser Atlas acoustilog and recorded 8560'-8000'. Ran densilog and recorded 8560'-8000'. Ran 6" bit and casing scraper and cleaned out to 8559'.

5-29 Ran Baker retrievable retainer and using Halliburton cementing truck pressure tested 7" casing as follows:

8525'-surface	1500 psi for 23 minutes
6000'-surface	2000 psi for 25 minutes
4500'-surface	2400 psi for 25 minutes
3000'-surface	2800 psi for 27 minutes
2000'-surface	3100 psi for 25 minutes
1000'-surface	3400 psi for 33 minutes

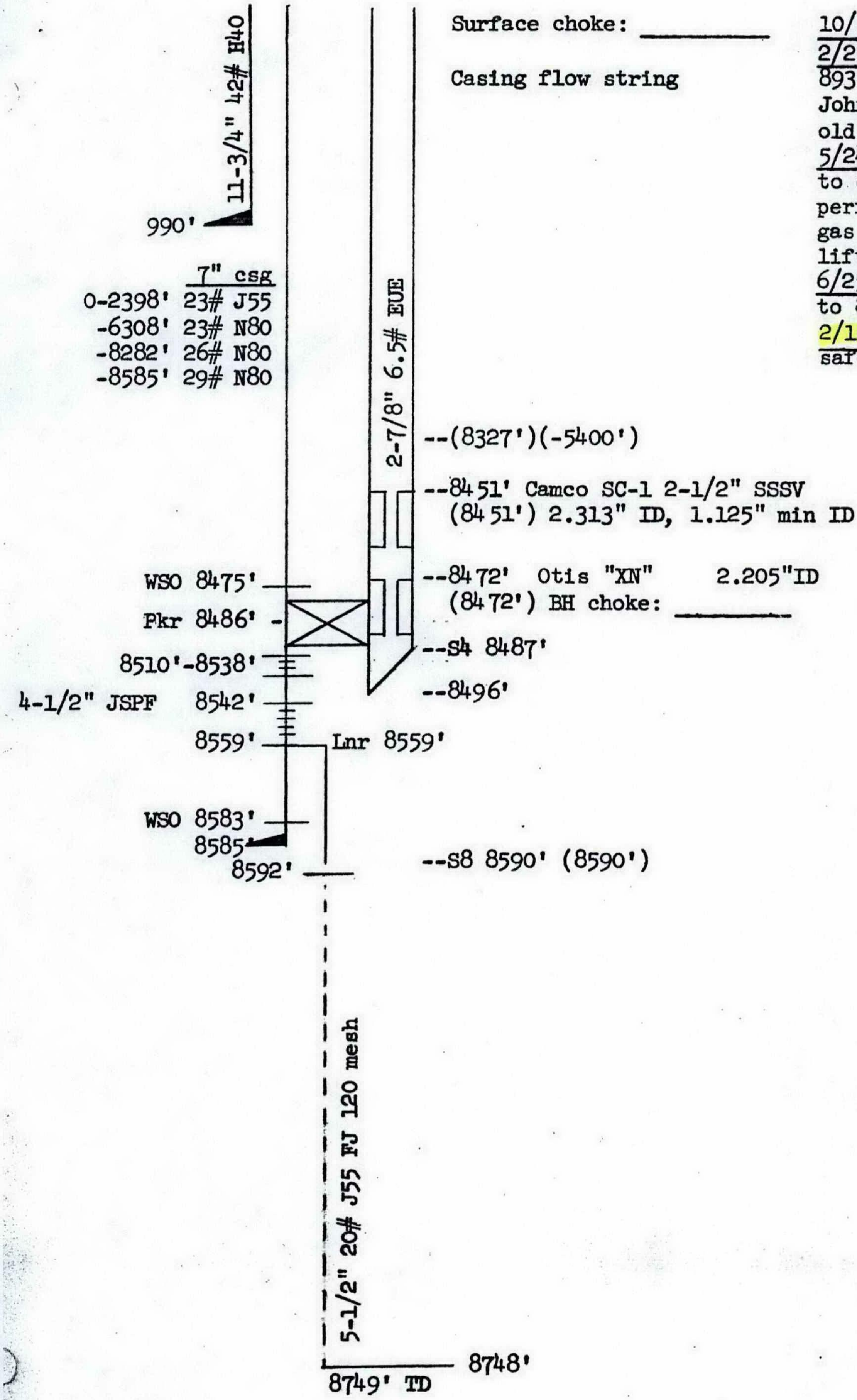
pressure Test

Using Dresser Atlas 4" Golden Jet gun, shot four 1/2" jet holes from 8542'-8538'. Ran Baker bridge plug and set at 8550'.

SED_RT_0057
AC_CPUC_0000025

Elevation: 2927"
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

1973

5-30 Ran Halliburton tester and set packer at 8471' with tail to 8487'. Opened tool at 11:45 A.M. with strong blow and gas to surface in 3 minutes, shut in and turned to trap at 11:53 A.M. Flowed gas at approximate rate of 4 MM cu. ft. per day for 33 minutes. Shut in for 65 minutes to take initial shut in pressure. Re-opened tool at 1:30 P.M. and flowed for 60 minutes through 1/4" surface choke and 5/8" choke in tester at rate of 1.7 MM cu. ft. per day with surface pressure of 1150 psi. Flowed from 2:30 P.M. until 4:00 P.M. through 1/2" surface choke at rate of 4.2 MM cu. ft. per day with surface pressure of 750 psi. Flowed 4:00 P.M. to 7:00 P.M. through 1" surface choke at rate of 4.5 MM cu. ft. per day with surface pressure of 575 psi. Shut in tester at 7:00 P.M. for final static pressure.

5-31 Bled pressure down to 225 psi (trap back pressure). Pulled tester at 8:45 A.M. for final shut in of 11 hours and 45 minutes. Opened backscuttle valve and circulated drilling fluid to pump gas to trap. Pulled out of hole and recovered drilling fluid in bottom 120' of 2-7/8" tubing below backscuttle valve. Recovered no sand in tubing or in tester.

PRESSURE RECORDER DATA:

Hydrostatic	3722 psi
Initial Flow	1338 psi
Initial Shut-in	1461 psi
Initial Flow 1/4"	1442 psi
Flow 1/2" Choke	1386 psi
Flow 1" Choke	1373 psi
Final Shut-in	1459 psi

Ran in with latching tool and found no sand on Baker bridge plug at 8550'. Backscuttled and recovered no sand. Pulled bridge plug to 4975' and reset same.

6-1 Removed casing spool. Removed rings and rubber packing from casing head. Filled 7" x 11-3/4" annulus with 50 bbls. of mud. Using jack hammers, dug concrete out of cellar for 20". Rigged up casing jack and spear and unlanded 7" casing with 196,000 lb. pull. Removed slips. Welder cut off conductor and 11-3/4" surface casing. Leveled and tack welded new casing head on 11-3/4" casing.

6-2 Completed welding casing head and checked weld with Gamma ray. Rigged up casing jacks and spear. Pulled 196,000 lbs. on 7" casing and landed on slips in casing head and installed packing. Cut off 4-1/2" of 7" casing and rebeveled top of casing. Tested casing head packing and secondary flange pack-off, both to 2800 psi for 30 minutes. Reinstalled B.O.P. Started in well with tool to retrieve bridge plug. ?

6-3 Idle.

6-4 Recovered bridge plug from 4975' and found no sand on bridge plug. Using Dresser Atlas 4" Golden Jet gun, shot four 1/2" holes per foot 8559'-8542' and 8538'-8510'. Perfs
Ran wire brush perforation cleaner and found 13' of fill circulated and worked brush from 8736'-8592'. Pulled out of well.

1973

6-5 Ran 2-7/8" tubing, including packer, nipple, sliding sleeve and five gas lift mandrels (details attached). Hydrotested tubing to 5000 psi and found no leaks. Landed tubing on doughnut with bottom of tubing at 8492'. Using Hydrotest, pumped down tubing but obtained circulation. Pulled and reran bottom gas lift valve with piano wire unit. Using rig pump, set packer but apparently could not shear ball seat.

6-6 Pumped water down tubing with hot oil truck and found seat had been sheared with rig pump. Using piano wire unit, shifted sleeve at 8390' to open position. Removed B.O.P., installed new X-mas tree and tested doughnut and tree to 3500 psi, each for 20 minutes. Circulated drilling fluid out of hole with lease water. Displaced water to top gas lift valve with nitrogen. Blew well down to zero pressure and shut-in. Moved out rig.

TUBING DETAILS

Derrick floor to top of tubing	0'-8.35'
160 jts. 2-7/8" 8rd., EUE, J-55	8.35'-4983'
KBMG mandrel w/BK valve 1050 psi	4983'-4995'
30 jts. 2-7/8" tubing	4995'-5914'
KBMG mandrel w/BK valve 1025 psi	5914'-5925'
28 jts. 2-7/8" tubing	5925'-6784'
KBMG mandrel w/BK valve 1000 psi	6784'-6795'
26 jts. 2-7/8" tubing	6795'-7589'
KBMG mandrel w/BK valve 975 psi	7589'-7600'
23 jts. 2-7/8" tubing	7600'-8314'
KBMG mandrel w/BK valve 950 psi	8314'-8325'
2 jts. 2-7/8" tubing	8325'-8387'
Baker model "L" sliding sleeve (open)	8387'-8390'
1 jt. 2-7/8" tubing	8390'-8421'
Baker "F" nipple	8421'-8422'
1 jt. 2-7/8" tubing	8422'-8453'
Baker FH hydrostatic packer	8453'-8460'
1 jt. 2-7/8" tubing	8460'-8491'
Baker ball seat & chamfered collar	8491'-8492'

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.

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
IF

Patrick J. Kinnear
Deputy Supervisor

[redacted]

Reconductoring of SCE's double-circuit, 66-kV Segments D and E would take place in the community of Mission Hills in the City of Los Angeles. ~~The~~ Two fiber optic cable installations are proposed ~~route~~ from San Fernando Substation: Telecommunications Routes #3 and #4. Telecommunications Route #3 would extend northeast from the substation to a fiber optic connection point within the ROW of an existing SCE 220-kV subtransmission line corridor. It~~,~~ would traverse northeast from the substation within the community of Mission Hills in the City of Los Angeles, through ~~into~~ the City of San Fernando~~,~~ and into ~~then~~ the community of Sylmar in the City of Los Angeles ~~(Telecommunications Route #3)~~(Figure 2-8).

Telecommunications Route #4 would extend northeast from San Fernando Substation along the same path as Telecommunications Route #3, but would be routed northwest at Truman Street in the City of San Fernando. Telecommunications Route #4 would follow Truman Street through the community of Sylmar to where it merges with San Fernando Road, and it would then continue northwest along San Fernando Road to a fiber optic connection point located at the entrance to Sunshine Canyon Landfill (Figure 2-8). The fiber optic line would be installed on existing overhead wood poles owned by SCE and the Los Angeles Department of Water and Power, and in new underground conduit in several locations, including new underground conduit that would cross under I-5. One new 45-foot-tall wood telecommunications pole would be installed along Telecommunications Route #4 just west of I-5 and Interstate 210 (I-210) at the intersection of San Fernando Road and Sepulveda Boulevard.

2.2 Components of the Proposed Project

2.2.1 Central Compressor Station

The proposed project would include the installation of electric motor–driven compressors with variable-speed drivers, to replace the existing gas turbine–driven compressors.

The proposed compressors would be installed at a new Central Compressor Station, which would be approximately 26,500 square feet (Figure 2-2). The proposed Central Compressor Station enclosures would house three new electric-driven, variable-speed compressors, as well as scrubbers (which remove impurities from the gas), piping, coolers, and electrical equipment (Figure 2-9). The station would be constructed in an area that includes the existing office buildings and parking within the footprint of the Plant Station site (Figure 2-2). The office buildings would be removed to allow for construction of the Central Compressor Station. The Central Compressor Station would not be visible from residential properties outside the storage field property line.

The proposed Central Compressor Station site would be fenced and paved for access control, fire control, and maintenance purposes. The station enclosures would be painted and have no reflective surfaces, but permanent nighttime lighting would be installed.

2.2.1.1 Electric-driven, Variable-speed Compressors

The three electric-driven, variable-speed compressors installed in the proposed Central Compressor Station would each have approximately 22,000 horsepower for a combined maximum output of approximately 66,000 horsepower. Combined, the compressors would be capable of compressing a total of approximately 450 to 600 million scf of natural gas per day. The maximum discharge pressure of the gas injected into the reservoir would be approximately 3,400 pounds per square inch, gauge.

<u>REQUIREMENTS FOR CALIFORNIA UNDERGROUND GAS STORAGE PROJECTS</u>

FINAL TEXT OF REGULATIONS

CALIFORNIA CODE OF REGULATIONS, TITLE 14
CHAPTER 4. DEVELOPMENT, REGULATION, AND CONSERVATION OF OIL AND GAS RESOURCES

Subchapter 1. Onshore Well Regulations

Article 3. Requirements

[REPEAL SECTION 1724.9]

1724.9. Underground Gas Storage Projects

~~(a) For all underground gas storage projects, the operator shall provide the data required under Section 1724.7 and the operator shall comply with the requirements of Section 1724.10, unless the requirement is clearly not applicable to a gas storage project or the Division otherwise advises that the requirement is not applicable to a gas storage project. The operator shall ensure that required project data is complete and current, regardless of the date of approval of the gas storage project. If project data for an existing project is incomplete, then the operator shall submit the required data to the Division as soon as is practicable. In addition to the data required under Section 1724.7, the operator of an underground gas storage project shall provide the Division with the following:~~

~~(1) Characteristics, petrophysical properties, mechanical properties, and maps of the cap rock, including areal extent, isopach thickness, structure contour, formation fracture gradient, primary and secondary permeability, lithology and lithologic variation, threshold pressure, and locations and characteristics of faults and fractures.~~

~~(2) Oil and gas reserves of storage zones prior to start of injection, including calculations.~~

~~(3) List of proposed surface and subsurface safety devices, tests, and precautions to be taken to ensure safety of the project.~~

~~(4) Proposed waste water disposal method.~~

~~(b) The Project Approval Letter for an underground gas storage project shall state the maximum and minimum reservoir pressure and include data and calculations supporting the bases for the pressure limits. The pressure limits shall account for the following:~~

SED_RT_0065

~~(1) The pressure required to inject intended gas volumes, particularly at total inventory, and the pressure limit shall not exceed the design pressure limits of the reservoir, wells, wellheads, piping or associated facilities.~~

~~(2) The minimum reservoir pressure shall not be designed less than historic minimum operated pressure unless reservoir geo-mechanical competency can be demonstrated to the Division's satisfaction. The impacts of intended minimum reservoir pressure shall be accounted for in the data required under subdivision (a)(1) as it relates to geomechanical stress, reservoir liquid influx, surface facility gas cleaning and liquid handling, and liquid disposal, all of which affect the maximum reservoir cycling capacity of the storage field and can impact mechanical integrity of the facilities.~~

~~(c) In addition to the mechanical integrity testing requirements under 1724.10(i), the operator shall monitor the tubing-casing annulus, if there is one, of each well that is part of an underground gas storage project. The operator shall monitor for presence of annular gas by measuring and recording annular pressure and annular gas flow. Such monitoring shall done at least once a day when the well is not being used for withdrawal. The operator shall evaluate any anomalous annular gas occurrence and immediately report it to the Division. The operator shall begin complying with this requirement within one month of the effective date of this section.~~

~~(d) Where installed, the operator of an underground gas storage project shall function test all surface and subsurface safety valve systems within three months of the effective date of this section, and every six months after that. The tests shall be conducted in accordance with manufacturer's recommendations to confirm operational integrity and mitigate any integrity isolation findings. The appropriate district office shall be notified at least 48 hours before performing testing so that Division staff may witness the operations, and documentation of the testing shall be maintained and available for Division review. A closed storage well safety valve system shall be manually re-opened at the site of the valve after an inspection and not opened from a remote location. Within 90 days of finding that a surface or subsurface safety valve is inoperable, the operator shall either repair or remove the safety valve or temporarily plug the well. A longer timeframe for addressing an inoperable surface or subsurface safety valve may be approved by the Division.~~

~~(e) Within 21 days of the effective date of this section, the operator of an underground gas storage project shall submit an inspection and leak detection protocol to the Division for review and approval. The protocol shall include inspection of the wellhead assembly and attached pipelines for each of the wells used in an underground gas storage project, and the surrounding area within a 100' radius of the wellhead of each of the wells used in an underground gas storage project, unless the operator can demonstrate that some part of that area is obstructed. The inspection protocol shall provide for inspection at least once a day, employing effective gas leak detection technology such as infrared imaging, and shall provide for immediately reporting detected leaks to the Division. The operator's selection and usage of gas leak detection technology shall take into consideration detection limits, remote detection of difficult to access locations, response time, reproducibility, accuracy, data transfer capabilities, distance from source, background lighting conditions, geography, and meteorology. The Division will consult~~

~~with the California Air Resources Board when reviewing an inspection and leak detection protocol submitted under this subdivision.~~

~~(f) Within three months of the effective date of this section, and annually thereafter, the operator of an underground gas storage project shall test the operation of the master valve and wellhead pipeline isolation valve for proper function and verify ability to isolate the well. The operator shall submit documentation of the results of testing done under this subdivision within 10 days of completing the testing, but shall immediately notify the Division if testing indicates a lack of function.~~

~~(g) Within six months of the effective date of this section, the operator of an underground gas storage project shall submit a Risk Management Plan to the Division for review and approval. The Risk Management Plan shall identify potential threats and hazards to well and reservoir integrity; assess risks based on potential severity and estimated likelihood of occurrence of each threat; identify the preventive and monitoring processes employed to mitigate the risk associated with each threat; and specify a process for periodic review and reassessment of the risk assessment and prevention protocols. Risk assessment and prevention protocols shall be consistent with and additional to any other existing requirement in statute or regulation. The Risk Management Plan shall specify a schedule for submission of risk assessment results to the Division. All Risk Management Plans shall include at least the following risk assessment and prevention protocols:~~

~~(1) Ongoing verification and demonstration of the mechanical integrity of each well used in the underground gas storage project and each well that intersects the reservoir used for gas storage. The protocols for verifying and demonstrating well integrity shall not be limited to compliance with the mechanical integrity testing requirements under Section 1724.10(j), and shall include consideration of the age, construction, and operation of each well.~~

~~(2) Corrosion monitoring and evaluation including consideration of the following:~~

~~(A) Evaluation of tubular integrity and identification of defects caused by corrosion or other chemical or mechanical damage;~~

~~(B) Corrosion potential of wellbore produced fluids and solids, including the impact of operating pressure on the corrosion potential of wellbore fluids and analysis of partial pressures;~~

~~(C) Corrosion potential of annular and packer fluid;~~

~~(D) Corrosion potential of current flows associated with cathodic protection systems;~~

~~(E) Corrosion potential of all formation fluids, including fluids in formations above the storage zone;~~

~~(F) Corrosion potential of uncemented casing annuli; and~~

~~(G) Corrosion potential of pipelines and other production facilities attendant to the underground gas storage project.~~

~~(3) Protocols for evaluation of wells and attendant production facilities that include monitoring of casing pressure changes at the wellhead, analysis of facility flow erosion, hydrate potential, individual facility component capacity and fluid disposal capability at intended gas and liquid rates and pressures, and analysis of the specific impacts that the intended operating pressure range could have on the corrosive potential of fluids in the system.~~

~~(4) Ongoing verification and demonstration of the integrity of the reservoir including demonstration that reservoir integrity will not be adversely impacted by operating conditions.~~
~~(5) Identification of potential threats and hazards associated with operation of the underground gas storage project including the following:~~
~~(A) Evaluation of likelihood of events and consequences related to the threats and hazards;~~
~~(B) Determination of risk ranking to develop preventive and mitigating measures to monitor or reduce risk;~~
~~(C) Documentation of risk evaluation and description of the basis for selection of preventive and mitigating measures;~~
~~(D) Provision for data feedback and validation; and~~
~~(E) Regular, periodic risk assessment reviews to update information and evaluate risk management effectiveness.~~
~~(6) Prioritization of risk mitigation efforts based on potential severity and estimated likelihood of occurrence of each threat.~~
~~(h) The requirements of this section shall not be construed to replace or restrict an operator's compliance with any specific requirements applicable to pipelines and associated facilities pursuant to Parts 190-199 of Title 49 of the United States Code of Federal Regulations.~~

Note: Authority cited: Sections 3013 and 3106, Public Resources Code; and Statutes of 2016, Chapter 673, Section 6. Reference: Sections 3106, 3220 and 3403.5, Public Resources Code.

[ADOPT NEW ARTICLE 4 WITH SECTIONS 1726, 1726.1, 1726.2, 1726.3, 1726.3.1, 1726.4, 1726.4.1, 1726.4.2, 1726.4.3, 1726.5, 1726.6, 1726.6.1, 1726.7, 1726.8, 1726.9, AND 1726.10]

Article 4. Requirements for Underground Gas Storage Projects

1726. Purpose, Scope, and Applicability.

The purpose of this article is to set forth regulations governing underground gas storage projects and gas storage wells. This article applies to underground gas storage projects and gas storage wells in existence prior to the effective date of this article, as well as new underground gas storage projects and gas storage wells. Underground gas storage projects and gas storage wells are not subject to the requirements of Sections 1724.6 through 1724.10.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.1. Definitions.

(a) The following definitions are applicable to this article:

(1) “Area of review” means the three-dimensional extent of the reservoir used for underground gas storage and surrounding areas that may be subject to its influence. The area

of review is delineated by the geologic extent of the reservoir such as confining strata, structural closure, decrease or loss of porosity and permeability, or hydrodynamic forces in a three dimensional image.

(2) "Confining strata" means the rock layer or layers at the boundaries of the storage reservoir acting as the primary barriers preventing migration of fluids.

(3) "Fluid" means liquid or gas.

(4) "Gas storage well" means an active or idle well used primarily to inject or withdraw gas from an underground gas storage project.

(5) "Reservoir" means the portion of the geologic stratum that is being used to store natural gas in an underground gas storage project. The entire depth interval of a reservoir from the shallowest to the deepest depth can be subdivided into one or more depth intervals, which are referred to in this article as "zones".

(6) "Underground gas storage project" means a project for the injection and withdrawal of natural gas into an underground reservoir for the purpose of storage. An underground gas storage project includes the reservoir used for storage, the confining strata, gas storage wells, observation wells, and any other wells approved for use in the project. An underground gas storage project also includes the wellheads and, to the extent that they are subject to regulation by the Division, attendant facilities, and other appurtenances.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3220 and 3403.5, Public Resources Code.

1726.2. Approval of Underground Gas Storage Projects.

(a) A Project Approval Letter shall be obtained from the Division before any injection or withdrawal occurs as part of an underground gas storage project. The Project Approval Letter shall specify the location and nature of the underground gas storage project, as well as the conditions of the Division's approval. Changes to the operational parameters of an underground gas storage project as set forth in the Project Approval Letter are subject to approval by the Division and shall be noted in either an addendum to the Project Approval Letter or a revised Project Approval Letter. Underground gas storage project operations shall not occur or continue unless consistent with the terms and conditions of a current Project Approval Letter.

(b) The Division will review underground gas storage projects periodically, but not less than once every three years, to verify adherence to the terms and conditions of the Project Approval Letter, and will periodically review the terms and conditions of the Project Approval Letter to ensure that they effectively prevent damage to life, health, property, the environment, and natural resources. Project Approval Letters are subject to suspension, modification, or rescission by the Division.

(c) If the Division determines that operation of an underground gas storage project is inconsistent with the terms and conditions of a current Project Approval Letter, or otherwise poses a threat to life, health, property, the environment, or natural resources, then upon written notice from the Division specified operations shall cease immediately, or as soon as it is safe to do so.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3220 and 3403.5, Public Resources Code.

1726.3. Risk Management Plans.

(a) For each underground gas storage project, the operator shall submit a project-specific Risk Management Plan to the Division for review and approval. For underground gas storage projects in existence at the time that this section goes into effect, the operator shall submit a Risk Management Plan in accordance with the requirements of this section within six months of the effective date of this section. If the Division identifies any deficiencies in the Risk Management Plan, then the Division will consult with the operator and identify an appropriate timeframe for correcting the deficiency. The Risk Management Plan shall specify a schedule for the operator to review and submit updates to the risk assessment and prevention and mitigation protocols to the Division. The Division will review the Risk Management Plan periodically, but not less than once every three years.

(b) The Risk Management Plan shall demonstrate that stored gas will be confined to the approved reservoir and that risks of damage to life, health, property, the environment, or natural resources are identified and prevented or effectively mitigated. In accordance with subdivision (c), the Risk Management Plan shall evaluate threats and hazards associated with operation of the underground gas storage project and identify prevention and mitigation protocols that effectively address those threats and hazards. The Division may, in its discretion, require additional data, additional risk assessment, or modification of prevention and mitigation protocols. Risk assessment and prevention and mitigation protocols in the Risk Management Plan shall be consistent with and in addition to any other existing requirements.

(c) The Risk Management Plan shall include a description of the methodology employed to conduct the risk assessment and identify prevention and mitigation protocols, with references to any third-party guidance followed in developing the methodology. The methodology shall include at least the following:

(1) Identification of potential threats and hazards associated with operation of the underground gas storage project, including identification of the most important potential accident scenarios associated with operation of the underground gas storage project;

(2) Quantitative risk assessment of the probability of threats and hazards and their consequences, using an appropriate methodology identified by the operator that includes:

(A) Evaluation of the frequency and range of consequences, including estimates of the uncertainties in the numerical values;

(B) Identification of the principal equipment failures, external initiating events, and operational errors associated with threats and hazards, and quantification of the impact of these occurrences on the probability of and consequences of the threats and hazards; and

(C) Identification of the engineered or natural features that most affect the extent of the consequences of threats and hazards, and a quantification of their relative roles, including an estimate of the uncertainties in the quantification;

(3) Identification of possible prevention and mitigation protocols to reduce, manage, or monitor risks, including evaluation of the efficacy and cost-effectiveness of the prevention protocols;

(4) Risk assessment on a well-by-well basis, to the extent that risks identified are specific to wells;

(5) Prioritization of risk prevention and mitigation efforts based on potential severity and estimated likelihood of occurrence of each threat;

(6) Selection and implementation of prevention and mitigation protocols;

(7) Documentation of the risk assessment process, including description of the basis for selection of prevention and mitigation protocols;

(8) Data feedback and validation throughout the risk assessment process; and

(9) Regular, periodic risk assessment reviews to update information and evaluate the effectiveness of prevention and mitigation protocols employed, which shall occur not less than once every three years and in response to changed conditions or new information.

(d) In addition to the contents required in subdivision (b), all Risk Management Plans shall include at least the following risk assessment and prevention and mitigation protocols:

(1) Well construction and design standards, consistent with the requirements of Section 1726.5 and including specification of the life expectancy of individual mechanical well barrier elements. If the operator has wells that do not conform with the requirements of Section 1726.5, then the Risk Management Plan shall include a work plan and schedule for either bringing the nonconforming wells into compliance or plugging and abandoning the wells in accordance with Public Resources Code section 3208. The work plan and schedule shall provide for full compliance with Section 1726.5 within seven years, with at least 10 percent of the nonconforming wells addressed in the first year and the total percentage of the nonconforming wells addressed increasing by 15 percent in each subsequent year. The work plan shall include prevention and mitigation protocols for monitoring and testing each well that is not yet in compliance with the requirements of Section 1726.5 so as to mitigate risks associated with the well to the extent feasible.

(2) For each gas storage well, evaluation of whether employment of surface and/or subsurface automatic or remote-actuated safety valves is appropriate based on consideration of at least the following:

(A) The well's distance from dwellings, other buildings intended for human occupancy, or other well-defined outside areas where people may assemble such as campgrounds, recreational areas, or playgrounds;

(B) Gas composition, operational pressures, total fluid flow, and maximum flow potential;

(C) The distance between wellheads or between a wellhead and other facilities, and access availability for drilling and service rigs and emergency services;

(D) The risks created by installation and servicing requirements of safety valves;

(E) The risks to and from the well related to roadways, rights of way, railways, airports, and industrial facilities;

(F) Proximity to environmentally or culturally sensitive areas;

(G) Alternative protection measures which could be afforded by barricades or distance or other measures;

(H) Age of well;

(I) The risks of sabotage;

(J) The current and predicted development of the surrounding area as reflected in the local general plan, topography and regional drainage systems, and environmental considerations;

(K) Topography and local wind patterns; and

(L) Evaluation of geologic hazards such as seismicity, landslides, subsidence, and potential for tsunamis.

(3) A schedule for verification and demonstration of the mechanical integrity of each well used in the underground gas storage project and each well that intersects the reservoir used for gas storage. The mechanical integrity testing protocols for gas storage wells shall, at a minimum, adhere to the requirements of Section 1726.6.

(4) Corrosion monitoring, evaluation, and mitigation including consideration of at least the following:

(A) Evaluation of tubular integrity and identification of defects caused by corrosion or other chemical or mechanical damage;

(B) Corrosion potential of wellbore produced fluids and solids, including the impact of operating pressures, temperatures, and compositions on the corrosion potential of wellbore fluids and analysis of partial pressures;

(C) Corrosion potential of annular and packer fluid;

(D) Corrosion potential of current flows associated with cathodic protection systems;

(E) Corrosion potential of all formation fluids, including fluids in formations above the storage zone; and

(F) Corrosion potential of uncemented casing.

(5) Ongoing monitoring of casing pressure changes at the wellheads of gas storage wells, analysis of facility flow erosion, individual facility component capacity and fluid disposal capability at intended gas and liquid flow rates and pressures, and analysis of the specific impacts that the intended operating pressure and temperature ranges could have on the corrosive potential of fluids in the system.

(6) Monitoring protocols in accordance with the requirements of Section 1726.7.

(7) Ongoing verification and demonstration of the integrity of the reservoir including demonstration that reservoir integrity will not be adversely impacted by operating conditions.

(8) Analysis and risk assessment of hazards associated with the formation of hydrates, and scale from the well stream under various pressure, temperature, and flow rates, including those beyond expected operating parameters.

(9) Analysis and risk assessment of natural and geologic hazards including, but not limited to, seismicity, faults, subsidence, inundation by tsunamis, sea level rise, and floods.

(10) Analysis and risk assessment of hazards associated with the potential for explosion or fire.

(11) If observation wells are employed, identification and documentation of baseline conditions such as wellbore pressure, pressure of monitored annuli, gas composition and liquid level.

(12) An assessment of human factors in operating and maintenance procedures. The human factors assessment shall consider staffing levels; the complexity of tasks; the length of time needed to complete tasks; the level of training, experience and expertise of employees; the human-machine and human-system interface; the physical challenges of the work environment in which the task is performed; employee fatigue and other effects of shiftwork and overtime; communication systems; and the understandability and clarity of operating and maintenance procedures. The human factors assessment shall also consider utilization of error-proof mechanisms, automatic alerts, and automatic system shutdowns.

(13) An effective training program with clearly stated goals. The training program shall specify the type and frequency of training and the risk assessments and prevention and mitigation protocols addressed.

(14) An equipment maintenance program that includes training and proactive inspection, repair, and replacement of equipment at risk of failure so as to ensure safe operation.

(15) An emergency response plan that at a minimum accounts for the threats and hazards identified in the Risk Management Plan and that complies with the requirements of Section 1726.3.1.

(16) Requests for notice from land use agencies of local land use decisions that could affect the Risk Management Plan, and providing notification to the Division of significant pending land use decisions.

(e) The operator shall adhere to the risk prevention and mitigation protocols detailed in its Risk Management Plan unless a variance has been approved by the Division in writing.

(f) The Division will provide completed Risk Management Plans and significant updates to the Risk Management Plans to the California Public Utilities Commission and post them on the Division's public internet website. If any part of a Risk Management Plan is subject to confidential treatment, then the Division will segregate the confidential records and only provide them if the California Public Utilities Commission has agreed to treat the records as confidential.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.3.1 Emergency Response Plan.

(a) The operator of an underground gas storage project shall have an emergency response plan approved by the Division and ready for immediate implementation. The emergency response plan shall specify a schedule for carrying out drills to validate the plan. The drills shall address the readiness of operator personnel with respect to their ability to interact with equipment and their ability to contact required third party service providers for the equipment.

The emergency response plan shall identify and consider onsite personnel, outside emergency responders, and potentially affected communities. The operators shall provide local emergency response entities at least 30 days to review and provide input on the emergency response plan.

(b) The emergency response plan shall at a minimum address the following scenarios:

(1) Collisions involving well heads;

(2) Well fires and blowouts;

(3) Hazardous material spills;

(4) Equipment failures;

(5) Natural disasters/emergencies;

(6) Leaks and well failures;

(7) Medical emergencies; and

(8) Explosions.

(c) The emergency response plan shall at a minimum include all of the following:

(1) Clearly written and communicated emergency response plan policy, goals, and objectives;

(2) An incident management system designed to address resource management, communication systems, and incident documentation;

(3) Written action plans establishing assigned authority to the appropriate person(s) at a facility for initiating effective emergency response and control;

(4) Accident-response measures that outline response activities, leakage mitigation approaches, and well control processes for well failure and full blowout scenarios;

(5) Prepositioning, as feasible, and identification of materials and personnel necessary to respond to leaks, including materials and equipment to respond to and stop the leak itself as well as to protect public health and safety.

(6) A schedule for regular drills, providing for an opportunity for involvement of the Division and local emergency response entities, and providing an opportunity for drills initiated by local emergency response entities;

(7) An effective training program with clearly stated goals. The training program shall specify the type and frequency of training and the emergency scenarios addressed;

(8) Recordkeeping for all drills and training;

(9) A schedule for regular evaluation and update of the emergency response plan;

(10) Protocols for emergency reporting and response to appropriate government agencies;

(11) Specification of personnel roles and responsibilities;

(12) Internal and external communication protocol;

(13) Up-to-date emergency contact information including area codes; and

(14) A protocol for public notice of a large, uncontrollable leak to any potentially impacted community, as defined in the Risk Management Plan, if the leak cannot be controlled within 48 hours of discovery by the operator.

(d) The operator shall review and update the emergency response plan after key personnel changes, but no less often than once every three years. When reviewing and updating the emergency response plan, the operator shall again provide local emergency response entities at least 30 days to review and provide input on the emergency response plan.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3183, 3184 and 3403.5, Public Resources Code.

1726.4. Underground Gas Storage Project Data Requirements.

(a) For all underground gas storage projects, the operator shall provide the Division with data, analysis, and interpretation that demonstrate that stored gas will be confined to the approved zone(s) of injection and that the underground gas storage project will not cause damage to life, health, property, the environment, or natural resources. The operator shall provide the data specified in this section and any data that, in the judgment of the Division on a case-by-case basis, are pertinent and necessary for the proper evaluation of the project. The operator shall ensure that required data is complete, current, and accurate, regardless of the date of approval of the gas storage project. The data submitted to the Division shall include at least the following:

(1) Oil and gas reserves of all storage zones prior to start of injection, including calculations, to indicate the storage capacity of the reservoir being considered for gas storage.

(2) Description of existing surface and subsurface safety devices, tests, and precautions to be taken to ensure safety of the project.

(3) Produced water disposal method.

(4) Maximum and minimum reservoir pressure for the underground gas storage project and the data and calculations supporting the bases for the pressure limits. The pressure limits shall account for the following:

(A) The pressure required to inject fluids, particularly at total inventory, shall not exceed the design pressure limits of the wells, well heads, pipelines, or other associated facilities; or the fracture pressure of the reservoir or confining strata.

(B) The minimum reservoir pressure shall take into account the historic minimum operating pressure and reservoir geomechanical competency. The impacts of intended minimum reservoir pressure shall be accounted for as it relates to geomechanical stress and liquid influx.

(5) An engineering and geological study demonstrating that injected gas will not migrate out of the approved zone or zones, such as through another well, geologic structure, faults, fractures or fissures, or holes in casing. The study shall include, but is not limited to:

(A) Statement of primary purpose of the project.

(B) Reservoir characteristics of each storage zone, such as porosity, permeability, average thickness, areal extent, fracture gradient, original and present temperature and pressure, and original and residual oil, gas, and water saturations.

(C) A comprehensive geologic characterization of the gas storage project including lithology of the storage zone or zones and sealing mechanisms as well as all formations encountered from surface to the deepest well in the project. The geologic characterization shall include any information that may be required to ensure injected or withdrawn gas and other reservoir fluids do not have an adverse effect on the project or pose a threat to life, health, property, the environment, or natural resources. The geologic characterization shall include potential pathways for fluid migration and areas or formations where potential entrapment of migrated fluid could occur. Information to accompany the geologic characterization shall include, but is not limited to:

(i) Structure contour maps drawn on a geologic marker at or near the top of each gas storage zone in the project area, indicating faults and other lateral containment features.

(ii) Isopach map of each gas storage reservoir or subzone and the confining strata in the project area.

(iii) At least two geologic cross sections, one on strike and one on dip, through at least four gas storage wells in the project area and the areas immediately adjacent.

(iv) A representative geophysical log to a depth below the deepest gas storage zone identifying all geologic units, formations, groundwater that has 10,000 or less milligrams per liter of total dissolved solids content, groundwater that has 3,000 or less milligrams per liter of total dissolved solids content, oil or gas zones, and gas storage reservoirs.

(v) Additional information may be requested by the Division on a case-by-case basis, and may include, but is not limited to: additional isopach maps, three-dimensional modeling, oil-water, gas-water, or oil-gas contact maps of the project, or other information which would delineate known features such as faults and fractures within the area of review for the underground gas storage project.

(D) Reservoir fluid data for each gas storage zone, such as oil gravity and viscosity, water quality, presence and concentrations of non-hydrocarbon components in the associated gas (e.g. hydrogen sulfide, helium, etc.), and specific gravity of gas.

(E) A map of the area of review showing the location and status of all wells within and adjacent to the boundary of the area of review. The wellbore path of directionally drilled wells shall be shown, with indication of the interval penetrating the gas storage zone(s) of the underground gas storage project.

(F) All data specified in Section 1726.4.1, provided in the form of graphical casing diagrams or flat file data sets, for all wells that are within the area of review and that are in the same or a deeper zone as the gas storage reservoir, including directionally drilled wells that intersect the area of review in the same or deeper zone.

(G) Identification of all wells associated with oil and gas production that are within the area of review but that are not in the same or a deeper zone as the underground gas storage project, including description of the total depth of the well and the estimated top of the gas storage reservoir below the well.

(H) Wells completed in or penetrating through the intended gas storage reservoir shall be identified and evaluated for containment assurance for the design of gas storage operation volumes, pressures, and flow rates. The operator shall identify, and the Division confirm, wells which may require integrity testing or well logging in order to meet the integrity demonstration. The Division may select plugged and abandoned wells to be re-entered, examined, re-plugged and abandoned, or monitored to manage identified containment assurance issues prior to approval of gas storage operations.

(I) The planned or estimated well drilling and plugging and abandonment program to complete the project, showing all gas storage wells, plugged and abandoned wells, other wells related to the project, and the boundaries of the underground gas storage project.

(J) Maps of the locations of injection wells and zones, mining, and other subsurface industrial activities not associated with oil and gas production or gas storage operations within the area of review, to the extent it is publicly available.

(6) A gas storage injection and withdrawal plan that includes at least the following:

(A) Maximum anticipated surface injection pressure and maximum anticipated daily rate of injection, by well.

(B) Monitoring system or method to be utilized to ensure the gas injected is confined to the intended approved zone(s) of injection.

(C) A wellhead monitoring system for the detection of leaks.

(D) A list of cathodic protection measures where employed.

(E) Analysis of the gas injected, submitted to the Division on an annual basis.

(7) The name and API number of all gas storage wells and other wells that are part of the underground gas storage project.

(8) Any data that, in the judgment of the Division on a case-by-case basis, are pertinent and necessary for the proper evaluation of the underground gas storage project.

(b) Updated data shall be provided to the Division if there are changes in operating conditions, such as gas plant or compressor changes, or if more accurate data become available, such as updated cross sections, new reservoir characteristics data, or new pressure flow modeling.

(c) All data filed with the Division under this section shall be submitted electronically. All maps, diagrams, and exhibits shall be clearly labeled as to scale, north arrow, coordinate system, and purpose, and shall clearly identify wells, boundaries, zones, contacts, and other relevant data.

(d) Where it is infeasible to supply the data specified in subdivision (a), the Division may accept alternative data that demonstrate that injected gas will be confined to the approved reservoir or reservoirs of injection and that the underground gas storage project will not cause damage to life, health, property, the environment, or natural resources.

(e) The operator shall consult with the Division if the operator believes that there is a basis under state or federal law for confidential treatment of any data submitted to the Division. If the Division agrees that there is a basis for confidential treatment of data submitted, then the Division will take appropriate steps to maintain the confidentiality of that data.

(f) The Division will make all data received under this section available to the California Public Utilities Commission upon request. If the requested records are subject to confidential treatment, then the Division will only provide the records if the California Public Utilities Commission has agreed to treat the records as confidential.

(g) For underground gas storage projects in existence at the time that this section goes into effect, the operator shall submit revised and updated project data in accordance with the requirements of this section within 180 days of the effective date of this section.

Note: Authority cited: Sections 3013, 3180 and 3106, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.4.1. Casing Diagrams.

(a) Casing diagrams submitted under Section 1726.4, subdivision (a)(5)(F), shall adhere to the following requirements:

(1) Casing diagrams shall at a minimum include all of the following data:

(A) Operator, lease name, well number, and API number of the well;

(B) Date the well was spudded;

(C) Ground elevation from sea level;

(D) Reference elevation (i.e., rig floor or Kelly Bushing);

(E) Base of groundwater that has 3,000 or less milligrams per liter of total dissolved solids content;

(F) Base of groundwater that has 10,000 or less milligrams per liter of total dissolved solids content;

(G) Sizes, weights, grades, and connection types of casing and tubing;

(H) Details on associated equipment such as subsurface safety valves, packers, and gas lift mandrels;

(I) Depths of casing shoes, stubs, and liner tops;

(J) Depths of perforation intervals, water shutoff perforations, cement port, cavity shots, cuts, patches, casing damage, top of junk or fish left in well, and any feature that influences flow in the well or may compromise the mechanical integrity of the well;

(K) Hole size diameter and depth of drilled hole;

(L) Cement plugs inside casings, including top and bottom of cement plug and the date(s) the plug(s) was emplaced, with method of determination;

(M) All cement fill behind casings, including top and bottom of cemented interval, with method of determination;

(N) Type and density of fluid between cement plugs;

(O) Depths and names of the formation(s), zone(s), and geologic markers penetrated by the well, including the top and bottom of the gas storage zone(s) and the top and bottom of the confining strata;

(P) All information used to calculate the cement slurry (e.g., volume, density, yield) including, but not limited to, cement type and additives, for each cement job;

(Q) All of the information listed in this section for all previously drilled or sidetracked well bores; and

(R) Identification of wellhead and wellhead valve assembly equipment by model and pressure rating.

(2) Measured depth and true vertical depth shall be provided for all measurements required under subdivision (a)(1).

(3) For directionally drilled wells, a directional survey shall be provided with inclination, azimuth measurements, bottomhole location, and surface location.

(4) Casing diagrams shall be submitted in an electronic format.

(5) For all wells to be used for gas injection and/or withdrawal, the casing diagram shall include the mechanical well barrier elements that comprise the primary and secondary barriers as specified in Section 1726.5.

(6) When multiple boreholes are drilled in a well, all of the information listed in this section is required for both the original hole and for any subsequent redrilled or sidetracked well bores.

(b) In lieu of graphical casing diagrams, operators may satisfy the requirements of Section 1726.4, subdivision (a)(5)(F), by submitting a flat file data set containing all of the information described in this section.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.4.2. Evaluation of Wells Within the Area of Review.

(a) The following requirements apply, at minimum and subject to augmentation by the Division as the Division deems appropriate on a project-specific basis, to ensure that wells within the area of review will not be a potential conduit for fluid migration outside the approved gas storage zone:

(1) All wells within the area of review and that are in the same or a deeper zone as the gas storage reservoir, including directionally drilled wells that intersect the area of review in the same or deeper zone, shall be evaluated for the potential to allow fluid to migrate outside of the approved zone of gas storage. The operator should identify, and the Division confirm, wells which may require integrity testing or well logging in order to provide the requisite assurances that such wells will not act as conduits for fluid migration.

(2) Plugged and abandoned wells within the area of review shall have cement across all perforations and extending at least 100 feet above the highest of the top of a landed liner, the uppermost perforations, the casing cementing point, the water shutoff holes, or the approved gas storage zone. The Division may select plugged and abandoned wells to be re-entered, examined, re-plugged and abandoned, or monitored to manage identified containment assurance issues.

(3) If a plugged and abandoned well within the area of review does not meet the cement specifications of subdivision (a)(2), the Division may approve an alternative demonstration that the well will not be a potential conduit for fluid migration outside the approved gas storage zone. The Division's approval of such an alternative demonstration shall be supported by written findings by the Division that identify each plugged and abandoned well in the area of review that does not meet the cement specifications of subdivision (a)(2), specify how the well does not meet the requirements of subdivision (a)(2), and identify the basis for the Division's approval of the alternative demonstration.

Note: Authority cited: Sections 3013, 3180 and 3106, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.4.3. Records Management.

(a) The operator of an underground gas storage project shall establish a Records Management Program to ensure documentation of essential information is created, maintained, protected, and retrievable when needed. The operator shall submit its Records Management Plan to the Division.

(b) The Records Management Program shall identify all records related to evidence of conformity to the requirements in this article as essential, and these records shall be maintained for the lifetime of the project.

(c) The Records Management Program shall establish a filing and storage strategy that ensures records are accessible and protected against environmental damage. Records may exist in many different formats and shall be managed according to the format in which they are maintained. Records may be protected following a graded approach, commensurate with the value of the record and the cost to reproduce the information.

(d) The Records Management Program shall establish a process for tracking records throughout their entire information life cycle so that it is clear at all times where a record exists, which is the most current version of the record, and the history of change or modification of the record.

(e) The Records Management Program shall allow for prompt retrieval and production of records upon request from the Division.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3181, 3220 and 3403.5, Public Resources Code.

1726.5. Well Construction Requirements.

(a) Operators shall design, construct, modify, and maintain gas storage wells and every other well that penetrates the gas storage reservoir of the operator's underground gas storage project to effectively ensure mechanical integrity under anticipated operating conditions for the underground gas storage project. The operator shall ensure that a single point of failure does not pose an immediate threat of loss of control of fluids and make certain that integrity concerns with a gas storage well are identified and addressed before they can become a threat to life, health, property, the environment, or natural resources. This section does not apply to wells that have been plugged and abandoned in accordance with Public Resources Code section 3208.

(b) Operators can demonstrate that a gas storage well adheres to the performance standard in subdivision (a) by demonstrating all of the following:

(1) The well has been constructed with both primary and secondary mechanical well barriers to isolate the storage gas within the storage reservoir and transfer storage gas from the surface into and out of the storage reservoir.

(A) The primary mechanical barrier is the barrier that is exposed to the withdrawal or injection flow stream. The primary mechanical barrier shall be able to withstand full operating pressure as demonstrated by the pressure testing required under Section 1726.6, subdivision (a)(3), and through annular pressure monitoring as required under Section 1726.7, subdivision (a). An example of a well configuration that meets the minimum requirements for a primary mechanical barrier is a well configuration that includes:

(i) A wellhead master valve;

(ii) Tubing hanger with seals;

(iii) Production tubing; and

(iv) A production packer.

(B) The secondary mechanical barrier is not exposed to the withdrawal or injection flow stream under normal operations. The secondary mechanical barrier shall be able to withstand full operating pressure as demonstrated by the pressure testing required under Section 1726.6, subdivision (a)(3), and casing evaluation logs as required under Section 1726.6, subdivision (a)(2). In the event of a primary mechanical barrier failure, the secondary mechanical barrier shall be able to contain the leaking fluids until the primary mechanical barrier is re-established. An example of a well configuration that meets the minimum requirements for a secondary mechanical barrier is a well configuration that includes:

(i) Wellhead components, including casing hanger and seal assembly; and

(ii) Production casing to surface.

(2) Each string of casing is designed to safely contain the expected internal and external pressures and tensile loads.

(3) The surface casing is of sufficient size, weight, grade, competency, and depth to support subsequent drilling operations.

(4) The production casing is of sufficient size, weight, grade, competency, and depth to maintain the well integrity, and is compatible with fluid chemical composition. The production casing is designed to accommodate fluids on injection and withdrawal at the maximum expected operational pressures and velocities. The production casing is free of open perforations or holes other than the planned completion interval(s). Perforations created for investigative or remedial work are sealed to establish hydraulic isolation.

(5) Casing connections are appropriate for use in the well design and exceed the expected mechanical loads.

(6) The gas storage well is cemented so as to maintain the integrity of the storage zone(s) by providing isolation of the reservoir and preventing communication of fluids from the storage zone or other zones of interest.

(7) All casing was cemented in a manner that ensures proper distribution and bonding of cement in the annular spaces. Additionally, cementing operations meet or exceed the following requirements:

(A) Surface casing is cemented with sufficient cement to fill the annular space from the shoe to the surface to protect ground water.

(B) Intermediate and production casings, if not cemented to the surface, are cemented in accordance with the requirements of Section 1722.4.

(8) For new wells, the cementing operations used a cement slurry designed for the anticipated wellbore and formation conditions.

(9) Cement plugs provide for effective zonal isolation.

(10) Any remedial cement slurry and placement techniques are designed for the specific wellbore conditions, formations, and type of repairs.

(11) Cement bond log or evaluation is on file that indicates an adequate cement bond between the casing, cement, and geologic formations. A competent cement bond extends across the confining strata, and at least 100 feet above the gas storage reservoir.

(12) For wells equipped with tubing and packer, packer is set in cemented casing within confining strata or other appropriate location.

(c) If the operator does not demonstrate that a gas storage well meets the criteria of subdivision (b), then the operator shall demonstrate that an alternative method of well design and construction has been employed that effectively adheres to the performance standard of subdivision (a). An alternative method of well design and construction under this subdivision shall include both primary and secondary mechanical well barriers to isolate the storage gas within the storage reservoir and transfer storage gas from the surface into and out of the storage reservoir. The Division will determine on a case-by-case basis whether the operator has effectively demonstrated that a gas storage well that does not conform to the criteria in subdivision (b) meets the performance standard in subdivision (a).

(d) The requirements of this section are in addition to all other well construction requirements of this chapter.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3220 and 3403.5, Public Resources Code.

1726.6. Mechanical Integrity Testing.

(a) The operator shall, at a minimum, conduct the following mechanical integrity testing on each gas storage well and every other well that penetrates the gas storage reservoir of the operator's underground gas storage project, with the exception of wells that have been plugged and abandoned in accordance with Public Resources Code section 3208:

(1) A temperature and noise log shall be conducted at least annually to ensure integrity. Logging shall include a repeat section of no less than 200 feet, preferably across intervals where anomalies are present. If an anomaly is identified that indicates a possible loss of or threat to the mechanical integrity of the well, then the operator shall immediately report the anomaly to the appropriate district office. If the operator is unable to explain any anomaly, then the well shall not be used for injection or withdrawal without subsequent approval from the Division.

(2) A casing wall thickness inspection to estimate internal and external corrosion, employing such methods as magnetic flux or ultrasonic technologies, shall be performed at least once

every 24 months to determine if there are possible issues with casing integrity. Logging shall include a repeat section of no less than 200 feet, preferably across intervals where anomalies are present. The results shall be compared against prior results and any other available data to determine the corrosion rate. If the casing wall thickness inspection indicates that within the next 24 months thinning of the casing will diminish the casing's ability to contain 115 percent of the well's maximum allowable operating pressure utilizing Barlow's equation or another, similarly effective method, then the well shall be remediated and shall not be used for injection or withdrawal without subsequent approval from the Division. The Division may approve a less frequent casing wall thickness inspection schedule for a well if the operator demonstrates that the well's corrosion rate is low enough that biennial inspection is not necessary.

(3) Pressure testing of the production casing shall be conducted at a minimum frequency determined on a well-by-well basis under Section 1726.3, subdivision (d)(3), provided that the well-specific minimum pressure testing frequency has been reviewed and approved by the Division. If the Division has not approved a well-specific minimum pressure testing frequency for a well as part of the Risk Management Plan, then the operator shall pressure test the well at least once every 24 months. If injection in the gas storage well is through tubing and packer, then the pressure test shall be of the casing-tubing annulus of the well. Pressure testing shall be conducted in accordance with the parameters specified in Section 1726.6.1. If a required pressure test is not successfully completed, then the operator shall immediately notify the Division and the well shall not be used for injection or withdrawal without subsequent approval from the Division.

(b) A newly constructed gas storage well, or a reworked gas storage well that has had its existing production casing modified from its previous condition during rework activities, shall be tested in accordance with subdivision (a) prior to use. The Division may waive some or all of the mechanical testing requirements for a reworked gas storage based on the nature of the work performed.

(c) The Division may require additional testing as needed to demonstrate the integrity of the well.

(d) The appropriate district office shall be notified at least 48 hours before performing mechanical integrity testing so that Division staff may have an opportunity to witness the testing. All mechanical integrity testing shall be documented and copies of test results shall be submitted to the Division in an electronic format within 30 days.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.6.1. Pressure Testing Parameters.

(a) Pressure testing required under Section 1726.6 shall be conducted according to the following parameters:

(1) Pressure testing shall be conducted with a liquid unless the Division approves pressure testing with gas.

(2) If pressure testing will be conducted with a liquid that contains additive other than brine, corrosion inhibitors, or biocides, then the operator shall consult with the Division regarding the contents of the liquid prior to commencing testing.

(2) The wellbore shall be filled with a stable column of fluid that is free of excess gasses.

(3) Pressure tests shall be recorded and a calibrated gauge shall be used that can record a pressure with an accuracy within one percent of the maximum allowable injection pressure.

(4) Pressure tests shall be conducted at an initial test pressure of at least 115 percent of the maximum allowable injection pressure at the wellhead.

(5) The pressure test shall be continuous for one hour. A pressure test is successful if the pressure gauge does not show more than a 10 percent decline from the initial test pressure in the first 30 minutes, and does not show more than a 2 percent decline from the pressure after the first 30 minutes in the second 30 minutes.

(b) The Division may modify the testing parameters on a case-by-case basis if, in the Division's judgment, the modification is necessary to ensure an effective test of the integrity of the casing.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.7. Monitoring Requirements.

(a) The operator shall monitor for the presence of gas in all annuli by measuring and recording annular and tubing pressure at least once a day. The operator shall evaluate any anomalous annular gas occurrence and immediately report it to the Division. This requirement may be met by employment of a real-time data gathering system, such as Supervisory Control and Data Acquisition.

(b) The operator shall monitor the material balance of an underground gas storage project's storage reservoir relative to the original design and expected reservoir behavior. The operator shall evaluate and correct unexpected conditions detected during monitoring in order to avoid an incident or loss. Monitoring frequency shall be based on factors such as reservoir and well fluid loss potential and flow potential, as outlined in the Risk Management Plan.

(1) The operator shall submit material balance support data to the Division at least once a year, or upon request by the Division.

(2) Acceptable reservoir integrity monitoring and analysis methods include, but are not limited to, the following four methods:

(A) Monitoring average reservoir pressure versus inventory and comparing that to expected conditions in order to allow for the discovery and correction of any anomalies or unexpected conditions. Liquid level shall be taken into account when utilizing observation wells. Semiannual field shut-in tests, usually conducted at the point of seasonally high and low inventories, shall be conducted for inventory verification.

(B) Installation and monitoring of strategically located observation wells in the vicinity of spill points, within an aquifer, and above the confining strata. Observation wells shall be in potential collector formations to detect the presence or movement of gas.

(C) Monitoring offset hydrocarbon production or disposal operations for unexplained flow or pressure changes. The monitoring shall include operations in zones above and below the storage reservoir as well as laterally offset locations.

(D) Conducting subsurface correlation and gas identification logs such as gamma ray-neutron logs to confirm the location of gas being injected into the intended storage reservoir, as needed.

(c) The operator shall immediately report to the Division any instance of an unintended surface or cellar gas release of any size, in any location within the area of review of the underground gas storage project. Unless the operator demonstrates that the gas is not from the underground gas storage project or a gas storage well, Division may require the operator to chemically fingerprint the gas from such a release, and the operator shall provide the results of the gas analysis to the Division as soon as they are available.

(d) The operator of an underground gas storage project shall employ a real-time data gathering system, such as Supervisory Control and Data Acquisition, by January 1, 2020. At a minimum, the real-time data gathering system shall be deployed and utilized in accordance with the following requirements:

(1) The real-time data gathering system shall include pressure sensors for every casing annulus and tubing with data transmission to an operations center.

(2) The real-time data gathering system shall have alarms set for each annulus to monitor for pressure indicative of potential leaks or potential migration of gas. The alarms shall alert the operations center if pressure exceeds preconfigured set points. For tubing, the alarm set point shall not be higher than the maximum allowable injection pressure at the wellhead. For the annulus between production casing and tubing, the alarm set point shall be determined based on annular fluid, the initial pressure when the packer was set, and operational configuration. For strings without any anticipated surface pressure, such as surface or intermediate casings, the alarm set point shall not be higher than 100 psi or the alarm set point approved under subdivision (d)(3)(C).

(3) If there is sustained casing pressure above 100 psi in a string without anticipated surface pressure, and it is believed to be caused by shallow gas or other fluid migration, then the operator shall do the following:

(A) The operator shall first bleed off annular pressure and track pressure and time for the well to build up pressure back to the observed sustained casing pressure.

(B) Next, the operator shall sample the fluids building up in the annulus and confirm that the accumulation is not due to migration of storage gas by performing chemical fingerprinting or other diagnostic tests approved by the Division.

(C) If the diagnostic testing under subdivisions (A) and (B) confirm that the pressure build-up is not due to migration of storage gas, the operator shall propose an alarm set point to the Division that is no greater than 100 psi above the observed sustained casing pressure, unless such pressure would pose a risk to casing integrity. The operator's proposal shall at a minimum address the results from the diagnostic testing, the effect of the proposed alarm set point pressure on casing integrity, the likely source of pressure and fluid composition determined from chemical fingerprinting, and a long-term monitoring plan. The alarm set point shall not be increased until it has been approved by the Division.

(D) If the observed sustained casing pressure plus 100 psi would pose a risk to the integrity of the casing, then the operator shall develop and implement a plan to address the situation, subject to the Division's approval.

(E) If the testing under subdivisions (A) and (B) indicate that the pressure build-up is due to migration of storage gas, then the operator shall conduct further testing to determine the pathway of migration and take remedial action as needed in accordance with a plan approved by the Division.

(e) The operator of an underground gas storage project shall develop a program, which shall be submitted to the Division for review and approval, to conduct a baseline and subsequent gas detection logs on each gas storage well to detect gas indications behind casing. The operator shall provide the results of the gas detection logs to the Division with comparison of the logs noting any changes in the indicated gas behind the casing. If the comparison indicates increasing gas accumulations behind casing, then the operator shall submit a response plan for the Division's approval.

(f) The operator of an underground gas storage project shall adhere to an inspection and leak detection protocol that has been approved by the Division. The protocol shall include inspection of the wellhead assembly and attached pipelines for each of the gas storage wells used in association with the underground gas storage project, and the surrounding area within a 100-foot radius of the wellhead of each of the wells used in an underground gas storage project. The inspection protocol shall provide for inspection at least once a day, employing effective gas leak detection technology such as infrared imaging, and shall provide for immediately reporting leaks to the Division. The operator's selection and usage of gas leak detection technology shall take into consideration detection limits, remote detection of difficult to access locations, response time, reproducibility, accuracy, data transfer capabilities, distance from source, background lighting conditions, geography, and meteorology. The Division will consult with the California Air Resources Board when reviewing an inspection and leak detection protocol submitted under this subdivision. The requirements of this subdivision shall cease to apply to an underground gas storage project if the California Air Resources Board approves a monitoring plan under its regulations for that facility.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.8. Inspection, Testing, and Maintenance of Wellheads and Valves.

(a) Where installed, the operator of an underground gas storage project shall test all surface safety valves on the wellhead and all subsurface safety valve systems at least every six months. The tests shall be conducted in accordance with American Petroleum Institute Recommended Practice 14B (6th Edition, September 2015), hereby incorporated by reference, or a Division approved equivalent, to confirm operational integrity. The appropriate district office shall be notified at least 48 hours before performing testing so that Division staff may witness the operations, and documentation of the testing shall be maintained and available for Division review. A closed storage well safety valve system shall be re-opened with operator staff at the site of the valve to ensure the absence of any unforeseen issues. Within 90 days of finding that a surface or subsurface safety valve is inoperable, the operator shall either repair the safety valve or temporarily plug the well. An appropriate alternative timeframe for testing a valve or addressing an inoperable surface or subsurface safety valve may be required by the Division.

(b) At least annually, the operator of an underground gas storage project shall test all valves on the wellhead, including the master valve and wellhead pipeline isolation valve for proper function and verify ability to isolate the well.

(c) The operator shall equip gas storage wells with valves to provide isolation of the wells from the pipeline system and to allow for entry into the wells.

(d) The operator shall equip all ports on the wellhead assembly above the casing bowl of gas storage wells with valves, blind flanges, or similar equipment that are rated to withstand the maximum operational pressures.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

1726.9. Well Leak Reporting.

(a) For the purposes of this section, and for the purposes of Public Resources Code sections 3183 and 3184, “reportable leak” means:

(1) A leak from a gas storage well that is above 50,000 parts per million by volume total hydrocarbons, as measured using methodology that the operator has demonstrated will provide consistent and reliable measurements, such as US EPA Reference Method 21;

(2) A leak from a gas storage well that is above 10,000 parts per million by volume total hydrocarbons, as measured using methodology that the operator has demonstrated will provide consistent and reliable measurements, such as US EPA Reference Method 21, for more than five days; or

(3) Any leak that poses a significant present or potential hazard to public health and safety, property, or to the environment.

(b) If a gas storage well has a reportable leak, then the operator shall immediately inform the Division.

(c) The requirements of this section are in addition to, and do not supersede, any other requirements for reporting or responding to leaks from a gas storage well.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3183, 3184, 3220 and 3403.5, Public Resources Code.

1726.10. Requirements for Decommissioning.

(a) If an operator intends to discontinue an underground gas storage project, then the operator shall submit a Decommissioning Plan to the Division. The Decommissioning Plan is subject to the Division's review and approval and shall ensure that stored gas will continue be confined to the approved zone(s) of injection and that the underground gas storage project will not cause damage to life, health, property, the environment, or natural resources. At a minimum, the Decommissioning Plan shall address all of the following:

(1) Identification of the intended use of the wells and facilities after decommissioning, including a plan for obtaining requisite approvals for the use.

(2) A plan for managing remaining gas in the underground gas storage reservoir.

(3) A plan for repurposing or decommissioning all wells and facilities associated with the underground gas storage project.

(4) Consultation with the California Public Utilities Commission.

(5) Any other information requested by the Division on a project-specific basis.

(b) An underground gas storage project is subject to the requirements of this article until the Division has approved a Decommissioning Plan and the Division has certified that the operator has completed all steps required under the Decommissioning Plan to the Division's satisfaction.

Note: Authority cited: Sections 3013, 3106 and 3180, Public Resources Code. Reference: Sections 3106, 3180, 3181, 3220 and 3403.5, Public Resources Code.

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.

<u>QUESTION 2:</u>

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.

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.

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 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.

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.

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 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?

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.

ATTACHMENT D

SOUTHERN CALIFORNIA GAS COMPANY

INTEROFFICE CORRESPONDENCE

TO M. E. Melton FROM J. B. Lane J B Lane / lw DATE Dec. 30, 1988

SUBJECT Summary of Porter 44 Incident

On December 14, 1988 a solvent injection program utilizing a Camco coiled tubing unit had been planned on well Porter 44 at Aliso Canyon. A similar procedure had been completed on Porter 39 at noon that day utilizing the same coiled tubing unit. While the contractors rigged off Porter 39 and moved to Porter 44, I stayed at Porter 39 and displaced the solvent into the well utilizing injection gas from the Station.

I arrived at Porter 44 as NowCam was running into the well with the coiled tubing. Bob Hazel, Rasha Hijazi, the WelChem representative, a field operator from Aliso Canyon, the coiled tubing unit operator and the two Halliburton operators were present.

At approximately 3:30 p.m. while running into the well with the coiled tubing, a sudden explosion occurred at the packoff of the coiled tubing unit. No injuries were suffered, but material was observed blowing out with the gas around the packoff area. The coiled tubing operator tried to come out of the hole while the gas was blowing, but stopped after what appeared to be between 30 second to 1 minute due to the increased intensity of the blowout. I heard second hand the unit operator attempted to operate the rams hydraulically inside the cab but I did not observe this.

The NowCam operator then tried to close the bottom set of rams manually by turning the manually operated rams on the BOPE stack itself. This placed the operator approximately 5' below the gas blowout area of the unit. The NowCam operator apparently was able to quickly shut one side of the rams (which we thought at the time to be pipe rams.) He then went to the other side of the rams and worked for several minutes trying to close the other ram without success. Due to physical fatigue he finally gave up on trying to close the ram.

During the immediate time after the blowout, the Halliburton crew was instructed to turn off the engine of the pump truck which was located approximately 10' from the well. After the NowCam operator stopped trying to come out of the hole with the coiled tubing unit, he was told to shutdown the unit due to concern of a spark setting of the gas blowing into the atmosphere.

After the rams were unsuccessfully operated, it became apparent the well would have to be killed from a remote location since the risk of a spark, thus igniting, at the wellsite was too great. A plan was then made and the appropriate contractors, people and equipment were called and/or ordered to kill Porter 44 from well Porter 46 which at the time provided the shortest length of isolated kill piping, it had a Baker tank onsite, and it had a large area to stage the necessary equipment.

While the planning was going on to commence the remote well kill, a hydrate apparently formed in the restricted area around the pipe ram area of the BOPE. It eventually shutoff the flow to a small leak. At this time, Halliburton was instructed to start their truck and remove it from the location so it could be utilized to start pumping for the kill.

Several minutes had elapsed while the well was in its "dormant" state, when the hydrate plug suddenly blewout and the well was flowing uncontrollably once again. Over the next 16 to 17 hours, the piping and equipment was maneuvered to the point where the well was finally killed and brought under control at 9:30 a.m. December 15.

In a short review, the NowCam personnel stated they had changed packing on the unit after Porter 39 and before Porter 44 due to wear. A piece of the new packing that blewout of the stuffing box of the coiled tubing unit on Porter 44 was found at the wellsite shortly after the blowout occurred. The packing appeared to have almost "melted" or been deformed by some chemical process during a quick examination. The people of NowCam later obtained the packing and apparently still have it in their possession. There is still considerable discussion as to how the well was finally killed as well as a step-by-step listing of all the events as they occurred during the incident. A more complete discussion of the incident will be provided later.

JBL:hr

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:	25-Oct-2015	**Well Name and Number:**	Standard Senson 25	Report #	1
Customer Name:	Southern Califonia 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:**	Gs		
Report Generated By:	Danny Walzel	**Job Type:**	Well Control		
Lease - Well #:	Standard Senson 25	**Rig No:**	N/A		

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
					$ -
General Daily Expense		D. Clayton / J. Kopeckey / D. Walzel	3	$ 325.00	$ 975.00
Hotel		D. Clayton / J. Kopeckey / D. Walzel	3	$ 148.00	$ 444.00
Airfare		D. Clayton / J. Kopeckey / D. Walzel	3	$ 1,818.00	$ 5,454.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
Estimated Daily Total					$ 40,065.00

Well Summary

Hour	Hour	Activity on Site
8:30	9:30	Boots & Coots personel travel to Bush Intercontinental Airport Houston, Texas.
9:30	11:45	Check in, board plane.
11:45	13:45	Fly from Houston, Texas to Los Angeles, CA.
13:45	13:15	Get rental car.
13:15	14:00	Drive from LAX to Aliso Canyon Storage Facility.
14:00	18:30	Met with Southern California Gas Company representatives. Traveled to Standard Senson 25 wellsite. Performed site
		assessment. Observed gas broaches to surface through several fissures on well pad. Discussed operations prior to broaching
		with client representatives. Was informed client attempted to pump down tubing and could not. Attempted to lube and bleed
		the 2-3/8" x 7" annulus. Pressure increased to 3,200 psi when broaches occurred. Operations were discontinued.
		Began sourcing slick line unit, frac tanks for kill fluid, dual pump truck, and additional pump iron.
18:30	19:00	Traveled to hotel.

Projected Operations

Rig up to flow 7" x 11-3/4" and 2-7/8" x 7" annulus to test seperator. Run diagnostic logs.

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	4.5	6				
Danny Walzel	4.5	6				
James Kopecky	4.5	6				
					Total Man-hours for Noted Date:	31.5

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:	26-Oct-2015	Well Name and Number:	Standard Senson 25	Report #	2
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
					$ -
General Daily Expense		D. Clayton / J. Kopecky / D. Walzel	3	$ 325.00	$ 975.00
Hotel		D. Clayton / J. Kopecky / D. Walzel	3	$ 148.00	$ 444.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
Estimated Daily Total					$ 34,611.00

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
6:30	7:00	Traveled from hotel to Aliso Canyon Storage Facility.
7:00	8:00	Attended morning meeting. Discussed fabricating A-Frame for slick line operations, sourcing intrinsically safe slick line unit,
		wellhead integrity, greasing and testing casing valves, and where to spot equipment on location.
8:00	8:30	Traveled to Standard Senson 25 wellsite. Performed site assessment. Gas activity was observed to be unchanged.
8:30	10:15	Observed 7" x 11-3/4" annulus pressure to be 428 psi. Dug out around wellhead to expose casing valve. Closed ball valve.
		Removed gauge and bushing from ball valve.
10:15	12:30	Operations were shut down for safety meeting and operational update.
12:30	14:00	Installed ball valve. Made up 602 iron from wellhead to test separator.
14:00	15:30	Checked wellhead pressures on 25A and 25B. 25A wellhead pressure 0 psi. 25B wellhead pressure 40 psi.
15:30	16:45	Began flowing well 25 7" x 11" annulus through test separator on 16/64" choke. 2-7/8" - 680 psi. 2-7/8" x 7" - 419 psi.
		7" x 11-3/4" - 413 psi.
16:45	17:00	Opened choke to 23/64" choke. 2-7/8" - 446 psi, 2-7/8" x 7" - 416 psi, 7" x 11-3/4" - 404 psi. Gas rate 8 Mscf/day. Temp - 48F.
		Shut down. Secured well.
17:00	18:30	Attended end of the day meeting. A slick line unit has been sourced. A total of 1,000 bbls of 10.0 ppg KCl was delivered to
		location. Sourced Halliburton HT400. Customer requested B&C HSE specialist. Mike Baggett will travel to location tomorrow.
		Welder sourced materials and will begin fabricating A-Frame.
18:30	19:00	Traveled to hotel.

Projected Operations

Rig up to flow 2-3/8" x 7" annulus to test separator. Spot slick line unit and HT400 pump truck.

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	11.5	1				
Danny Walzel	11.5	1				
James Kopecky	11.5	1				
					Total Man-hours for Noted Date:	37.5

7047 W. Greens Rd.
Houston, TX. 77066
281-931-8884

HALLIBURTON BOOTS & COOTS SERVICES

This is an estimate only for the date listed on this sheet. This is not an invoice.

Date:	27-Oct-2015	**Well Name and Number:**	Standard Senson 25 — Report # 3
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
Airfare		Mike Baggett	1	$ 2,527.00	$ 2,527.00
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
					$ -
Estimated Daily Total					$ 46,974.00

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
6:45	7:15	Traveled from hotel to location. Inspected slick line unit.
7:15	8:30	Performed site assessment. Discussed the day's operations with SCGC representatives. 7" x 11-3/4" - 325 psi. 2-7/8" x 7" - 307 psi. 2-7/8" - 34 psi.
8:30	10:15	Rigged up to flow 2-7/8" x 7" annulus to test separator.
10:15	11:15	Spot slick line unit and generator.
11:15	13:30	Continued isolating kill lines and with draw lines to well 25.
13:30	14:45	Opened orbitz valve on with draw line. 2-7/8" x 7" annulus pressure decreased from 260 psi to 15 psi. Monitored well.
14:45	15:00	7" x 11-3/4" - 308 psi. 2-7/8" x 7" - 16 psi. 2-7/8" - 78 psi. Began bleeding 7" x 11-3/4" annulus through test separator on 11/64 choke. Choke pressure 275 psi. Gas rate 3 Mcf/day.
15:00	15:30	Opened choke to 23/64. Choke pressure 300 psi. 2-7/8" x 7" - 21 psi. 2-7/8" 75 psi. Closed choke. 7" x 11-3/4" - 310 psi. 2-7/8" x 7" - 25 psi. 2-7/8" - 78 psi. Mike Baggett arrived on location. Met with SCGC safety representatives.
15:30	14:00	Secured well.
14:00	17:30	Continued rigging up slick line unit. Met with welder and slick line crew to discuss required modifications to A-Frame. Rigged up Halliburton HT400 pump truck.
17:30	18:00	Departed location. Traveled to hotel.

Projected Operations

Attempt to run in the hole with sinker bars.

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	10.25	1				
Danny Walzel	10.25	1				
James Kopecky	10.25	1				
Mike Baggett	2	7				
					Total Man-hours for Noted Date:	42.75

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:	28-Oct-2015	Well Name and Number:	Standard Senson 25	Report #	4
Customer Name:	Southern California Gas Company	County:	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	State:	California		
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
		Estimated Daily Total			$ 44,447.00

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
6:45	7:15	Traveled from hotel to location.
7:15	7:45	Attended morning safety/operations meeting.
7:45	8:00	Performed site assessment. Gas flow from fissures on well pad appear to have decreased.
8:00	9:30	Checked pressures on 25 well. 7" x 11-3/4" - 325 psi. 2-7/8" x 7" - 128 psi. 2-7/8" - 170 psi. Bled tubing pressure to 86 psi.
9:30	11:30	Closed all casing valves. Installed A-Frame on well. Continued rigging up slick line. (10:00) Checked pressure on 2-7/8" x 7" annulus - 134 psi. Bled to 124 psi.
11:30	12:15	Made up 1-5/8" sample bailer. Stabbed lubricator. Opened up well. 2-7/8" x 7" - 109 psi. 2-7/8" - 87 psi. RIH with sample bailer Sat down hard at 467 ft. Pulled out of the hole. Inspected sample bailer. Observed polymer on tool. Tool temperature 47 deg F. Fluid level - 300 ft.
12:15	12:45	Lunch.
12:45	14:15	Shot fluid levels on 7" x 11-3/4" and 2-7/8" x 7" annulus. 7" x 11-3/4" - 43 ft. 2-7/8" x 7" - 164 ft.
14:15	15:30	Lined up Halliburton to pump 8.7 ppg Flozane down tubing.
15:30	16:15	Filled kill line with 9.5 bbls. Pumped 3.1 bbls. Pump pressure increased to 350 psi. Monitored 5 minutes. Pressure increased to 377 psi. Pumped 0.2 bbls. Tubing pressure 500 psi. Monitored for 5 minutes. Tubing pressure increased to 525 psi. Pumped 0.5 bbls. Tubing pressure increased to 776 psi. Monitored for 5 minutes. Tubing pressure increased to 801 psi. Pumped 0.1 bbls. Tubing pressure 998 psi. Monitored for 5 minutes. Tubing pressure increased to 1,027 psi. Pumped 0.1 bbls. Tubing pressure 1,220 psi. Monitored for 5 minutes. Tubing pressure increased to 1,337 psi. Pumped 0.1 bbls. Tubing pressure 1,480 psi. Monitored for 5 minutes. Tubing pressure 1,603 psi.
16:15	17:00	Tubing pressure 1,824 psi. Bled to 1,790 psi. Continued monitoring well. (16:50) Tubing pressure 2,400 psi. Closed tubing head valve. Tubing pressure remained constant. Pressure on pump truck increased to 2,595 psi. Suspect communication with field injection lines. Made up 1-5/8" sample bailer.
17:00	17:30	Ran in hole with sample bailer. Tagged hard at 467 ft. Pulled out of the hole. Secured well.
17:30	18:00	Attended end of the day meeting.
18:00	18:30	Travel to hotel.

Projected Operations

Rig down A-Frame. Move in crane. Run in the hole with additional weight bars and attempt to work through obstruction. Source coiled tubing unit.

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	10.75	1			
Danny Walzel	10.75	1			
James Kopecky	10.75	1			
Mike Baggett	10.75	1			
				Total Man-hours for Noted Date:	47

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:	29-Oct-2015	Well Name and Number:	Standard Senson 25	Report #	5
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
		Estimated Daily Total			$ 44,447.00

Well Summary

Standard Senson 25 has broached to surface with several fissures on pad site. Surface casing pressure fluctuates between 505 psi and 770 psi.
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
6:30	7:00	Traveled from hotel to location.
7:00	7:30	Attended morning safety/operations meeting.
7:30	8:15	Performed site assessment. Observed ice on fissures around cellar. Fissures appeared to have made fluid overnight. Checked
		pressures on SS 25. 2-7/8" - 429 psi. 2-7/8" x 7" - 353 psi. 7" x 11-3/4" - 505 psi.
8:15	8:30	7" x 11-3/4" pressure - 515 psi. Flowed annulus for fifteen minutes. Shut in. Casing pressure 509 psi.
8:30	9:30	Moved in and rigged up crane. Laid down lubricator. Removed A-Frame from well. 2-7/8"- 360 psi. 2-7/8" x 7" - 420 psi.
		7" x 11-3/4" - 560 psi. Checked pressures on 25B. 2-7/8" - 2,450 psi. 2-7/8" x 7" - 2,450 psi. 7" x 11-3/4" - 44 psi.
9:30	10:30	Western wireline added sinker bar and lubricator.
10:30	10:45	Shot fluid levels on SS 25.
10:45	11:00	Bled 2-7/8" x 7" annulus f/ 456 psi t/ 440 psi.
11:00	12:00	Installed 2-9/16" 5M upper master valve. 2-7/8" - 375 psi. 2-7/8" x 7" - 462 psi. 7" x 11-3/4" - 591 psi.
12:00	12:30	Held PJSM to discuss slick line operations.
12:30	13:15	Made up 1.625" sample bailer. Stabbed lubricator. RIH. Sat down at 37 ft. POOH. Tool temperature 59 deg F. 2-7/8" - 54 psi.
13:15	13:45	Stabbed lubricator. RIH with 1.625" sample bailer. Sat down at 37 ft. POOH. Tool temperature - 19 deg F. Observed ice
		in sample bailer. Rigged down slick line.
13:45	14:15	Met with HALCO representatives to discuss coiled tubing operations. A coiled tubing unit is being mobilized from Houma, LA.
14:15	15:30	Blew down with draw and kill lines from 450 psi to 50 psi. Discussed removing lines to isolate SS 25 from facility lines.
15:30	16:00	Attended end of the day meeting. Coiled tubing unit will take 2 days to arrive at location. Will remove lateral lines from SS 25.
		Will move Halliburton pump truck closer to SS 25. SCGC will continue running diagnostics on nearby wells.
16:00	18:00	Continued monitoring pressures. (16:30) 2-7/8" - 51 psi. 7" - 685 psi. 11-3/4" 731 psi. (17:00) 2-7/8" - 55 psi. 7" - 634 psi.
		11-3/4" - 697 psi. (17:30) 2-7/8" - Shut in. 7" - 631 psi. 11-3/4" - 770 psi.
18:00	18:30	Traveled to hotel.

Projected Operations

Remove lateral lines from SS 25. Rig up CT. Wash through hydrates. Attempt to kill well with 10.8 ppg CaCl2.

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	1			
Danny Walzel	11	1			
James Kopecky	11	1			
Mike Baggett	11	1			
				Total Man-hours for Noted Date:	48

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:	30-Oct-2015	Well Name and Number:	Standard Senson 25 — Report # 6
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

Well Summary

Standard Senson 25 has broached to surface with several fissures on pad site. Surface casing pressure fluctuated between 750 psi and 830 psi.
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
6:30	7:00	Traveled from hotel to location.
7:00	7:30	Attended morning safety/operations meeting.
7:30	8:15	Performed site assessment. Gas flow from fissures has decreased. Checked pressures on 25 well. 2-7/8" - Shut in. 7" - 614 psi. 11-3/4" - 823 psi.
8:15	11:45	Isolated wells 25A and 25B from injection and withdraw lines. Blew down lines from 250 psi to 0 psi. Met with Weatherford representative to discuss equipment requirements for coiled tubing operations. (10:50) Well 25 11-3/4" casing pressure decreased from 830 psi to 750 psi.
11:45	12:30	Removed tubing kill lateral from well 25.
12:30	13:00	Lunch
13:00	15:00	Removed kill and withdraw laterals from 7" casing spool and with draw line from tubing head. Removed 3-1/8" 5M manumatic valve from 7" casing head. Removed 2-1/6" 5M manumatic from tubing head. Installed 2-1/16" 5M valve on same. Installed 3-1/8" 5M 2" LP companion flanges with 2" tapped bull plugs with needles valve on 7" annulus casing valves. Installed 2-1/16" 5M 2" LP companion flanges with 2" tapped bull plugs with needle valves on tubing head casing valves. Installed tapped flanges w/ 2" LP needle valves on kill and with draw lines.
15:00	16:00	Nippled up 2-9/16" 5M x 4-1/16" 10M DSA, 4-1/16" 10M Gate Valve, and 4-1/16 10M x 4-1/16" 15M DSA on upper master valve. Installed Rotemount transducers on well 25 7" casing outlet valve and 11-3/4" casing outlet valve. 7" - 585 psi. 11-3/4" - 770 psi.
16:00	17:30	Well 25A: Bled 8-5/8" casing from 920 psi to 700 psi. Shut in. Well 25: 7" - 584 psi. 11-3/4" - 771 psi.
17:30	18:00	Traveled to hotel.

Projected Operations

Kill 25A & 25B. Rig up on well 25 to pump and flow from casing annuli and tubing. Prepare for coiled tubing operations.

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	10.5	1				
Danny Walzel	10.5	1				
James Kopecky	10.5	1				
Mike Baggett	10.5	1				
					Total Man-hours for Noted Date:	46

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:	31-Oct-2015	Well Name and Number:	Standard Senson 25	Report #	7
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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
6:30	7:15	Traveled from hotel to location.
7:15	7:30	Attended morning safety/operations meeting. Performed site assessment. Well 25: Tbg - Shut in. 7" - 574 psi. 11-3/4" - 716 psi.
7:30	9:30	Checked surface casing pressure on 25A - 52 psi. Removed slick line equipment from Pad 25. Spotted hydraulic choke manifold.
9:30	11:00	Removed companion flanges from tubing head outlet valves. Installed 2-1/16" x 1502 thread half adapter flanges on same.
		Removed companion flange from 7" casing outlet valve. Installed 3-1/8" 5M x 1502 thread half adapter flange. Installed 1" plug
		valve.
11:00	12:30	Lined up on 25A tubing. 25A tubing pressure 2,600 psi. 8-5/8" - 940 psi. Well 25: 7" - 576 psi. 11-3/4" - 737 psi.
		Pumped 30 bbls 8.7 ppg polymer pill. Displaced with 152 bbls 8.5 ppg KCl. Shut down. Tubing pressure 550 psi. 8-5/8" casing
		889 psi. Well 25: 7" - 578 psi. 11-3/4" - 749 psi. Well 25A: Bled 8-5/8" casing from 889 psi to 770 psi. Shut in.
12:30	13:00	Lunch.
13:00	13:30	Removed gauges and 3-1/8" 5M companion flange from 7" casing outlet valve. Installed 3-1/8" 5M x 1502 thread half adapter
		flange. Installed 1" plug valve and gauges.
13:30	14:00	Well 25A: Bled 8-5/8" casing pressure from 770 psi to 0 psi.
14:00	15:45	Filled 25A 2-7/8" x 8-5/8" annulus with 205 bbl 8.5 KCl. Left 50 psi on annulus and 600 psi on 2-7/8" tubing.
15:45	16:30	Met with welder to discuss fabricating valve extension handle to operate wellhead ball valves. Well 25: 2-7/8" - Shut in.
		2-7/8" x 7" - 584 psi. 7" x 11-3/4" - 727 psi.
16:30	17:00	Traveled to hotel.

Projected Operations

Kill 25B. Rig up on well 25 to pump and flow from casing annuli and tubing. Prepare for coiled tubing operations.

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	9.25	1			
Danny Walzel	9.25	1			
James Kopecky	9.25	1			
Mike Baggett	9.25	1			
				Total Man-hours for Noted Date:	41

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:	1-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	8
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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
6:30	7:15	Traveled from hotel to location.
7:15	7:30	Attended morning safety/operations meeting.
7:30	7:45	Performed site assessment. Well 25: 2-7/8" - Shut in. 7" - 676 psi. 11-3/4" - 690 psi.
7:45	8:30	Met with Halliburton Coiled Tubing Supervisor. Discussed well situation and where to spot coiled tubing equipment.
8:30	11:15	Rigged up on 25B. Tubing pressure - 2,500 psi. 8-5/8" - 2,440 psi. Pumped 30 bbls 8.7 ppg polymer pill down tubing. Pumped
		387 bbls 8.5 ppg KCl. Shut down. Tubing pressure 0 psi. 8-5/8" - 0 psi.
11:15	11:45	Well 25: Installed valve extension handle on outer well head casing valve.
11:45	12:30	Lunch.
12:30	12:45	Well 25B: Tubing Pressure - 0 psi. 8-5/8" - 0 psi. 13-3/8" - 42 psi. Well 25 A: 2-7/8" - 1,000 psi. 8-5/8" - 140 psi.
		13-3/8" - 0 psi. Well 25: 2-7/8" - Shut in. 7" - 694 psi. 11-3/4" - 679 psi.
12:45	14:30	Prepared location for coiled tubing equipment. Met with Halliburton and Onyx. Discussed rig up requirements for well 25. Onyx
		is going to fabricate 602 x 1502 cross overs for return lines. Rigged down and moved out 40T crane.
14:30	16:00	Moved in and rigged up 110T crane. Coiled tubing reel arrived at Aliso Canyon Storage Facility.
16:00	16:30	Attended end of the day meeting.
16:30	17:00	Traveled to hotel.

Projected Operations

Rig up on well 25 to pump and flow from casing annuli and tubing. Prepare for coiled tubing operations.

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	9.25	1.25			
Danny Walzel	9.25	1.25			
James Kopecky	9.25	1.25			
Mike Baggett	9.25	1.25			
				Total Man-hours for Noted Date:	42

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:	2-Nov-2015	**Well Name and Number:**	Standard Senson 25 — Report # 9
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
				Estimated Daily Total	$ 44,447.00

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
6:30	7:15	Traveled from hotel to location.
7:15	7:45	Morning safety/operations meeting. Performed site assessment. Well 25: 2-7/8" - Shut in. 7" - 686 psi. 11-3/4" - 663 psi.
7:45	10:45	Rigged up return line from 7" annulus to choke manifold. Installed panic line.
10:45	12:00	Offloaded and spotted 1.5" coiled tubing reel.
12:00	13:15	Offloaded cab and injector. Well 25: 2-7/8" - Shut in. 7" - 682 psi. 11-3/4" - 638 psi.
13:15	14:30	Offloaded coiled tubing power pack, hydraulic tank, and stripper .
14:30	15:45	Offloaded coiled tubing BOP stack, goose neck, generator, and two hose baskets.
15:45	17:00	(16:10) Well 25: 11-3/4" pressure decreased to 284 psi. 7" decreased to 659 psi. Offloaded tool house and hose baskets.
		Moved man lift to pad 25.
17:00	17:30	Attended end of the day meeting.
17:30	18:00	Traveled to hotel.

Projected Operations

Rig up coiled tubing. Wash through hydrates. Kill well 25.

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	10.25	1.25			
Danny Walzel	10.25	1.25			
James Kopecky	10.25	1.25			
Mike Baggett	10.25	1.25			
				Total Man-hours for Noted Date:	46

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:	3-Nov-2015	**Well Name and Number:**	Standard Senson 25 — Report # 10
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL levels at well 25 cellar were 100%. LEL levels 25 ft from well 25 were 14%.
		Well 25: 2-7/8" shut in. 7" - 626 psi. 11-3/4" - 599 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	7:15	Took LEL readings around well 25. LEL levels at cellar were 100%. LEL levels 25 ft from well 25 were 0 - 6%.
7:15	12:00	Spotted coiled tubing control cab, reel, and generator. Began rigging up. Installed line from tubing head to choke line.
		Spotted HT400 pump truck.
12:00	12:30	Lunch.
12:30	17:00	Continued rigging up coiled tubing unit. (13:00) Well 25: 2-7/8" - Shut in. 7" - 645 psi. 11-3/4" - 623 psi. Spotted MI/Swaco
		choke panel. Rigged up and function tested. Function tested BOP's. Nippled up 4-1/16" 10M riser. Nippled up BOP's.
		Installed kill lines. Dressed coiled tubing and installed connector. Delivered 490 bbls of 10.8 ppg CaCl2 to location.
17:00	17:30	Attended end of the day meeting. Will pull test and pressure test in the morning.
17:30	18:00	Traveled to hotel.

Projected Operations

Pull test. Pressure test. Wash through hydrates. Kill well 25.

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	11.5	0.75			
Danny Walzel	11.5	0.75			
James Kopecky	11.5	0.75			
Mike Baggett	11.5	0.75			
				Total Man-hours for Noted Date:	49

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:	4-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 11
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar - 44%. LEL 25 ft from well 25 0 - 5%. 2-7/8" - Shut in. 7" - 512 psi.
		11-3/4" - 555 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	8:15	Pull tested coil tubing with 15k lbs.
8:15	9:00	Filled coil tubing with 19.5 bbls 10.8 ppg CaCl2.
9:00	13:00	Held PJSM to discuss pressure testing operations. Tested reel to 300/8,000 psi for 10 minutes each test. Test good.
		Filled stack. Trouble shoot leak in kill line. Tested choke line to 300/4,000 psi 5 minutes/test. Change out two lo-torq valves.
		Continued pressure testing choke line. Observed leak from adapter flange on choke manifold. Tightened flange. Tested both
		BSR's to 300 psi low/4,000 psi high. Tests good.
13:00	14:00	Made up wash assembly BHA.
14:00	17:30	Stabbed injector. Tested BOP's to 300 psi low and 4,000 psi high. Tested choke manifold valves to 300 psi low and 4,000 psi
		high. Trouble shoot leak in choke manifold. Secured well for the night. Well 25: Tbg - Shut in. 7" - 523 psi. 11-3/4" - 488 psi.
17:30	18:00	Attended end of the day meeting.
18:00	18:15	Traveled to hotel.

Projected Operations

Complete pressure testing. Wash through hydrates. Kill well 25.

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	11.5	0.75			
Danny Walzel	11.5	0.75			
James Kopecky	11.5	0.75			
Mike Baggett	11.5	0.75			
				Total Man-hours for Noted Date:	49

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:	5-Nov-2015	**Well Name and Number:**	Standard Senson 25 — Report # 12
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar - 25%. LEL 25 ft from well 25 0 - 6%. 2-7/8" - Shut in. 7" - 551 psi.
		11-3/4" - 467 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	7:30	Discussed yesterday's pressure testing. Will continue trouble shooting choke manifold and retest coil tubing BOP's
7:30	8:00	Greased valve #2 on choke manifold.
8:00	11:15	Pressure tested choke manifold valves to 300 psi low and 4,000 psi high. Valve #2 did not test.
11:15	13:30	Pressure tested lower BSR's to 300 psi low and 4,000 psi high. Changed out valve #2.
13:30	15:00	Shell tested choke manifold to 300 psi low and 4,000 psi high. Test good. Tested valve #2 to 300 psi low and 4,000 psi high.
		Test good. 11-3/4" - 515 psi.
15:00	18:00	Made up wash assembly BHA. Stabbed injector. Tested lower and upper pipe rams to 300 psi low and 4,000 psi high. Tests
		good. Tested stripper to 300 psi low and 4,000 psi high. Test good. Removed injector and stood back. Secured well.
18:00	18:30	Traveled to hotel.

Projected Operations

Complete pressure testing. Wash through hydrates. Kill well 25.

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	12	0.75			
Danny Walzel	12	0.75			
James Kopecky	12	0.75			
Mike Baggett	12	0.75			
				Total Man-hours for Noted Date:	51

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:	6-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	13
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar - 44%. LEL 25 ft from well 25 0%. 2-7/8" - Shut in. 7" - 560 psi. 11-3/4" - 460 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	8:30	Greased Rotac valves on kill line. Made up wash assembly BHA. Stabbed injector. Tested stripper and outside Rotac valve to 300 psi low and 4,000 psi high. Test good. Tested BPV 300 psi low and 4,000 psi high. Test good. Broke circulation in riser at 1 bpm. Maintained 2,800 psi back pressure with choke.
8:30	9:00	Held BOP drill with essential personnel.
9:00	10:00	Ran in hole to swab valve. Pumped 3 bbls of glycol and displaced out of the reel with 19 bbls 10.8 ppg CaCl2.
10:00	16:00	Held PJSM. Applied 3,000 psi on riser. Opened swab valve. Pressure stabilized at 2,700 psi. Began washing down at 3/4 bpm maintaining 2,900 psi with choke. Pump pressure 6,500 psi. Tagged up at 20 ft. Washed down to 53 ft. Pumped 5 bbls glycol. Displaced out of the coil with 19 bbls of 10.8 ppg CaCl2. Shut down. Applied 3,300 psi pressure. Waited 10 minutes. Pressure decreased to 2,800 psi. Continued washing down at 3/4 bpm holding 2,800 psi back pressure. Found bottom of hydrate plug at 188 ft. Continued washing down. At 482 ft choke pressure decreased to 1,200 psi. Unable to maintain back pressure. Lost returns. Experienced drag. Continued pumping without returns. Pulled coil tubing up into riser. Began pumping down tubing tubing head outlet. At 2 bpm PP - 41 psi. At 4 bpm PP - 120 psi. Continued pumping down tubing at 1 bpm waiting on polymer pill.
16:00	17:30	Began pumping polymer pill 4 bpm. Pump pressure 100 psi. Pumped total of 62 bbls. Gas activity from fissures increased. Observed polymer from fissures around cellar. Shut down pumping operations. Tubing pressure 0 psi. Evacuated personnel. 11-3/4" - 64 psi. 7" - 305 psi. Flowed gas from 7" and 11-3/4" annulus to open top tank. Activity from fissures appeared to decrease. Shut in well. 7" - 262 psi. 11-3/4" - 71 psi.
17:30	18:00	Attended end of the day meeting. Discussed running caliper tool on slick line to determine restriction at 482 ft. Pumped approxiamtely 200 bbls without returns.
18:00	18:15	Traveled to hotel.

Projected Operations

Kill well 25.

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	12	0.75			
Danny Walzel	12	0.75			
James Kopecky	12	0.75			
Mike Baggett	12	0.75			
				Total Man-hours for Noted Date:	51

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:	7-Nov-2015	**Well Name and Number:**	Standard Senson 25	Report #	14
Customer Name:	Southern California Gas Company	**County:**	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	**State:**	California		
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar - 54%. LEL 25 ft from well 25 49%. 2-7/8" - 940 psi. 7" - 229 psi. 11-3/4" - 60 psi. Could not start equipment due LEL levels.
6:30	7:00	Attended morning operations meeting. Discussed bleeding off tubing. Discussed removing mushroom from stripper to rig up slickline.
7:00	8:45	Installed gauge on tubing. Tubing pressure 1,100 psi.
8:45	9:30	Monitored well.
9:30	10:00	Tubing pressure 1,146 psi. 7" - 228 psi. 11-3/4" - 59 psi. Bled tubing to 1,110 psi. Bled gas and fluid. Shut in. 7" - 228 psi. 11-3/4" - 59 psi. After 10 minutes tubing pressure increased to 1,161 psi.
10:00	10:30	Tubing pressure 1,170 psi. 7" - 231 psi. 11-3/4" - 60 psi. Bled tubing to 1,070 psi. Bled gas and fluid. Shut in. 7" - 231 psi. 11-3/4" - 60 psi. After 10 minutes tubing pressure increased to 1,226 psi.
10:30	11:00	Attempted to shoot fluid levels. Could not detect fluid levels due to well noise.
11:00	14:00	Start equipment. Removed mushroom from stipper. Spotted slickline unit and rigged up. (11:45) 2-7/8" - 1298 psi. 7" - 222. 11-3/4" 60 psi. (13:45) 2-7/8" - 1,407 psi. 7" - 227 psi. 11-3/4" - 60 psi.
14:00	15:00	Made up 4-1/16" 15M x Bowen X-over on stripper.
15:00	17:00	Made up 2.30" gauge ring. Stabbed lubricator. Tested lubricator to 300 psi low and 4,000 psi high. Test good. Equalized swab valve with 1,250 psi. Opened swab valve and ran in hole. Estimated fluid level - 3,750 ft. Tagged nipple profile 8,425 ft. Pulled out of the hole. Secured well. Laid down lubricator. 2-7/8" - 1584 psi. 7" - 217 psi. 11-3/4" - 60 psi.
17:00	17:30	Traveled to hotel.

Projected Operations

Run production logging tool (CCL, Temp, Spinner). Run tubing caliper.

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	0.75			
Danny Walzel	11	0.75			
James Kopecky	11	0.75			
Mike Baggett	11	0.75			
				Total Man-hours for Noted Date:	47

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:	8-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 15
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar - 100%. LEL 25 ft from well 25 35 - 75%. 2-7/8" - 1,660 psi. 7" - 218 psi.
		11-3/4" - 65 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	8:15	Continued monitoring LEL levels. Commenced operations.
8:15	11:15	Began making up slickline tools. Tool string: Spinner, ITL CL, Temperature, Pressure, and GR. Stabbed lubricator.
		2-7/8" - 1,681 psi. 7" - 192 psi. 11-3/4" - 62 psi.
11:15	14:15	Pressure tested lubricator to 300/4,000 psi. Test good. Equalized swab valve with 1,500 psi. Opened swab valve RIH at 50 fpm.
		sat down at 8,425 ft. (13:15) 2-7/8" - 1,615 psi, 7" - 212 psi. 11-3/4" - 65 psi.
14:15	15:45	Pulled out of the hole at 100 fpm. In lubricator. Secured well.
15:45	16:00	Laid down lubricator. Down load data. Began preparing logs. Shut down for the night.

Projected Operations

Run gyro and tubing caliper.

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	12	0.75			
Danny Walzel	12	0.75			
James Kopecky	12	0.75			
Mike Baggett	12	0.75			
				Total Man-hours for Noted Date:	51

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:	9-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	16
Customer Name:	Southern California Gas Company	County:	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	State:	California		
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar - 100%. LEL 25 ft from well 25 35 - 75% (North side of pad). LEL around equipment 0%. 2-7/8" - 1,620 psi. 7" - 215 psi. 11-3/4" - 66 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	10:30	Rigged up e-line. SDI began preparing to run gyro.
10:30	11:15	Decision was made to run/noise temp. Made up noise/temp tools.
11:15	12:15	Stabbed lubricator. Tested to 300/4,000 psi. Test good. Equalized swab valve with 1,500 psi. Opened swab valve. RIH. Pulled out of hole to check noise/temp tools.
12:15	13:15	Pulled into lubricator. Secured well. 2-7/8" - 1,585 psi. 7" - 216 psi. 11-3/4" - 69 psi. Changed out noise/temp tools.
13:15	18:00	Stabbed lubricator. Tested to 300/4,000 psi. Test good. Equalized swab valve with 1,500 psi. Opened swab valve. RIH. Logged temperature down to 8,435 ft. Log noise out of the hole. Secured well. Laid down lubricator. 2-7/8" - 1,585 psi. 7" - 218 psi. 11-3/4" - 69 psi.
18:00	18:30	Attended end of the day meeting.
18:30	18:45	Traveled to hotel.

Projected Operations

Run gyro and tubing caliper.

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	12.5	0.5			
Danny Walzel	12.5	0.5			
James Kopecky	12.5	0.5			
Mike Baggett	12.5	0.5			
				Total Man-hours for Noted Date:	52

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:	10-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	17
Customer Name:	Southern California Gas Company	County:	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	State:	California		
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. LEL at Well 25 cellar: 75 - 100%. LEL 25 ft from well 25 25 - 75%. 2-7/8" - 1,624 psi. 7" - 211 psi. 11-3/4" - 70 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	9:30	SDI prepared to run gyro.
9:30	12:00	Stabbed lubricator. Tested lubricator to 300/4,000 psi. Test good. Equalized swab valve with 1,500 psi. Opened swab valve. RIH. Attempted to orient gyro. Unsuccessful. Pulled out of the hole.
12:00	14:00	Tested gyro. Cut 300 feet of e-line. Made up gyro.
14:00	16:00	Stabbed lubricator. Tested lubricator to 300/4,000 psi. Test good. RIH. Could not orient gyro. Well temperature and vibrations affecting tool. Pulled out of the hole.
16:00	17:00	Secured well. Laid down lubricator. Rigged down SDI.
17:00	17:45	Attended end of the day meeting. Located 2-7/8" EZSV in Longview, Texas.
17:45	18:00	Traveled to hotel.

Projected Operations

Prepare for kill.

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

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:	11-Nov-2015	**Well Name and Number:**	Standard Senson 25	Report #	18
Customer Name:	Southern California Gas Company	**County:**	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	**State:**	California		
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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" - 1,705 psi. 7" - 227 psi. 11-3/4" - 75 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	12:00	Drained riser to vac truck. Nippled down coil tubing BOP's. Nippled down riser and 4-1/16" 10M gate valve. Installed 2-9/16" 5M gate valve on swab valve. Installed 2-9/16" 5M x Bowen adapter flange. Tested to 300 psi low and 5,000 psi high. Test good. Talked with Western Wireline representative. Ordered out 2 Baker 5 setting tools to set 2-7/8" EZSV. Halliburton is flying 2 2-7/8" EZSV's from Longview, Texas and setting sleeves from Utah. Tools will arrive tonight. Bridge Plug conversion kits are being machined in Ventura, California.
12:00	15:00	Back loaded slickline unit and sent to staging area. Back loaded lateral lines from well 25. Pulling 10.8 ppg CaCl2 from frac tank. Will cut to 9.4 ppg.
15:00	15:30	2-7/8" - 1,707 psi. 7" - 229 psi. 11-3/4" - 85 psi. Flowed 11-3/4" casing for 5 minutes on 32/64 choke. Flowing casing pressure 69 psi. Shut in. 11-3/4" - 85 psi. Flowed 7" casing on 28/64 choke for 15 minutes. Flowing casing pressure - 200 psi. Shut in 7" casing pressure 220 psi. 2-7/8" - 1,703 psi. 7" - 220 psi. 11-3/4" - 84 psi.
15:30	17:00	Continued removing equipment from location in preparation for kill. Discussed kill plan with SCGC representative.
17:00	17:30	Traveled to hotel.

Projected Operations

Set EZSV in tubing. Perforate tubing. Kill well.

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	0.5			
Danny Walzel	11	0.5			
James Kopecky	11	0.5			
Mike Baggett	11	0.5			
				Total Man-hours for Noted Date:	46

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:	12-Nov-2015	Well Name and Number:	Standard Senson 25	Report # 19
Customer Name:	Southern California Gas Company	County:	Los Angeles	
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	State:	California	
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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" - 1,737 psi. 7" - 240 psi. 11-3/4" - 108 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	11:15	Two 2-7/8" EZSV's arrived on location. Baker 5 setting tool arrived on location. Stabbed lubricator. Tested to 300/4,000 psi with HAL pump. Test good. Laid down lubricator. Made up 2-7/8" EZSV. Tested lubricator to 400/4,000 psi. Test good.
11:15	15:00	Equalized swab valve with 1,500 psi. Opened swab valve. RIH. Set EZSV at 8,393 ft. Pulled out of hole.
15:00	15:30	2-7/8" - 1,694 psi. 7" - 245 psi. 11-3/4" - 105 psi. Bled tubing to 1,195 psi. Shut in. 2-7/8" - 1,195 psi. 7" - 245 psi. 11-3/4" - 105 psi.
15:30	16:00	Attended end of the day meeting. Discussed perforating tubing and kill plan.
16:00	16:30	Traveled to hotel.

Projected Operations

Perforate tubing. Kill well.

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	10	0.75			
Danny Walzel	10	0.75			
James Kopecky	10	0.75			
Mike Baggett	10	0.75			
				Total Man-hours for Noted Date:	43

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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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

7047 W. Greens Rd.
Houston, TX. 77066
281-931-8884

HALLIBURTON
BOOTS & COOTS SERVICES

This is an estimate only for the date listed on this sheet. This is not an invoice.

Date:	14-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 21
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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" - 1,610 psi. 7" - 245 psi. 11-34" - 35 psi.
6:30	7:30	Checked pressures on Well 25A: 2-7/8" - 680 psi. 8-5/8" - 80 psi. Checked pressures on Well 25B: 2-7/8" - 2,375 psi. 8-5/8" - 1,500 psi.
7:30	8:30	Bled Well 25 7" annulus from 245 psi to 200 psi. Bled gas. Shut in and monitored.
8:30	16:30	Cleaned location and equipment. Discussed pumping barite pill with SCGC representatives. Created program for pumping barite pill. Gave to SCGC for review. Performed pilot tests with chemicals for 18.0 ppg pill. Samples proved to be pumpable with good settling times. (15:15) Well 25: 2-7/8" - 1.690 psi. 7" - 213 psi. 11-3/4" - 32 psi. Moved in and rigged up HAL batch mixer. Sucked out Well 25 cellar. 11-3/4" casing valve is covered with silt. Ordered out Super Sucker.
16:30	18:00	Filled frac tank on Pad 25 with 500 bbls 9.4 ppg brine. Modified pump line to pump junk shots down 7" annulus.
18:00	18:15	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	10	0.5			
Danny Walzel	10	0.5			
James Kopecky	12	0.5			
Mike Baggett	12	0.5			
				Total Man-hours for Noted Date:	46

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:	15-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	22
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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" - 1,607 psi. 7" - 217 psi. 11-34" - 32 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	7:45	Cleaned location.
7:45	10:30	Began moving chemicals for barite pill to pad 25. Began mixing 22 bbl 18.0 ppg barite pill. Held PJSM.
10:30	11:15	Began pumping 9.4 ppg CaCl2. Initial pump pressure - 1,645 psi. Staged pumps up to 5 bpm. After 50 bbls pumped PP - 83 psi.
		Increased pump rate to 8 bpm. After 75 bbls pumped PP - 1,305 psi. Gas rate from fissures increased followed by oil and brine.
		After 170 bbls pumped PP - 1,550 psi. Pumped 19 bbls 18.0 ppg barite pill. Began displacing with 9.4 ppg CaCl2 at 8.0 bpm.
		PP - 220 psi. After displacing 35 bbls PP - 1,367 psi. After displacing 45 bbls PP - 1,500 psi. After displacing 50 bbls pump
		pressure 1,250 psi. (11:15) Shut down. 2-7/8" - 0 psi. 7" - 107 psi. 11-3/4" - 22 psi.
11;15	14:00	Monitored well. Flow from fissures stopped briefly and then began flow gas. (12:20) 2-7/8" began increasing. 7" - 205 psi.
		11-3/4" - 35 psi. (13:00) 2-7/8" - 220 psi. 7" - 190 psi. 11-3/4" - 38 psi. (14:00) 2-7/8" - 600 psi. 7" - 190 psi. 11-3/4" - 40 psi.
		(15:00) 2-7/8" - 980 psi. 7" - 220 psi. 11-3/4"- 39 psi. (16:00) 2-7/8" - 1159 psi. 7" - 251 psi. 11-3/4" - 37 psi.
14:00	14:30	Attended end of the day meeting. Discussed pumping another barite pill. Will pump 35 bbl 18.0 ppg barite pill.
14:30	14:45	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	10.5	0.5			
Danny Walzel	10.5	0.5			
James Kopecky	10.5	0.5			
Mike Baggett	10.5	0.5			
				Total Man-hours for Noted Date:	44

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:	16-Nov-2015	**Well Name and Number:**	Standard Senson 25	Report #	23
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%.
		LEL level 25 ft from well 0 to 100%. LEL around equipment 0 - 75%. 2-7/8" - 1,688 psi. 7" - 218 psi. 11-3/4" - 33 psi.
6:30	7:00	Attended morning safety/operations meeting. Will wait for LEL readings to decrease before starting equipment.
7:00	13:00	Continued monitoring LEL's around location. Cleaned e-line unit in preparation for logging operations. Filled batch mixer with 22
		bbls fresh water. Transported barite pill materials to pad 25. Prepared barite pill program and submitted to SCGC for review.
		Continued cleaning equipment and location.
13:00	13:30	Operations were shut down for the day due to LEL levels. Assisted with DOGGR afternoon survey. 2-7/8" - 1,696 psi. 7" - 211
		psi. 11-3/4" - 33 psi.
13:30	13:45	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	7.5	0.5				
Danny Walzel	7.5	0.5				
James Kopecky	7.5	0.5				
Mike Baggett	7.5	0.5				
					Total Man-hours for Noted Date:	32

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:	17-Nov-2015	**Well Name and Number:**	Standard Senson 25 — Report # 24
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%.
		LEL level 25 ft from well 0 to 100% LEL around equipment 0 - 77%. Winds out of the North 40 - 50 mph.
		2-7/8" - 1668 psi. 7" - 204 psi. 11-3/4" - 35 psi.
6:30	7:00	Attended morning safety/operations meeting. Decision was made to wait for LEL levels to subside before starting equipment.
7:00	11:00	Escorted HAL and T&T crane personnel to wellsite to inspect equipment.
11:00	14:00	Talked with B&C Houston about relief well trajectories. Provided surface locations and Well 25 survey data.
14:00	14:30	Escorted DOGGR representatives to Well 25 for afternoon survey. Decision was made to end operations for the day due to LEL
		levels. 2-7/8" - 1,688 psi. 7" - 209 psi. 11-3/4" - 32 psi. Secured location. Placed absorbent boom across access road.
14:30	15:00	Attended end of the day meeting with state agency representatives and SCGC.
15:00	15:15	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	9	0.5			
Danny Walzel	9	0.5			
James Kopecky	9	0.5			
Mike Baggett	9	0.5			
				Total Man-hours for Noted Date:	38

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:	18-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 25
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	1	**NO CHARGE**	1	$ 4,000.00	$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
		Estimated Daily Total			$ 44,447.00

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%. LEL level 25 feet from well - 0 to 100%. LEL level around equipment 0 - 100%. 2-7/8" - 1,597 psi. 7" - 199 psi. 11-3/4" - 34 psi.
6:30	7:00	Attended morning safety/operations meeting. Discussed pumping barite pill.
7:00	8:00	Identified location north of well pad 25 to spot pump, frac tanks, and batch mixer. Began preparing location for equipment.
8:00	9:00	Continued monitoring LEL around well pad 25.
9:00	10:00	Began mixing 35 bbls 18.0 ppg barite pill. Began pumping 9.4 ppg CaCl2 down tubing. Began pumping at 0.5 bpm. Pump pressure - 1,650 psi. Staged pumps to 5 bpm. After 50 bbls pump pressure - 65 psi. Shut down. Perforations clear. Well unloaded tubing.
10:00	10:15	Held PJSM.
10:15	11:00	Began pumping 9.4 ppg CaCl2. Staged pumps up to 6.0 bpm. PP - 125 psi. At 45 bbls pumped gas increased from fissure. Observed brine and oil from fissure. After 65 bbls pumped increased pump rate to 8 bpm. PP - 225 psi. At 70 bbls pumped PP increased to 987 psi. After 100 bbls pumped PP - 1,116 psi. After 130 bbls pumped increased pump rate to 9.0 bpm. PP - 1,838 psi. At 230 bbls pump PP - 1,830 psi. Winds began shifting out of the North. Pumped 35 bbl 18.0 ppg barite pill. Displaced with 13 bbls at 8.0 bpm. PP - 1,333 psi. Pumped 17 bbls at 6.0 bpm. Pump pressure 123 psi. Pumped 10 bbls at 4 bpm. PP - 74 psi. Pumped 10 bbls at 1 bpm. PP - 68 psi. Total volume displaced 50 bbls. Shut down. Pump pressure 0 psi.
11:00	16:30	Monitored well. 2-7/8" - 36 psi. 7" - 190 psi. 11-3/4" - 48 psi. (11:30) 2-7/8" 45 psi. 7" - 175 psi. 11-3/4" - 40 psi. (12:30) 2-7/8" - 80 psi. 7" - 150 psi. 11-3/4" - 40 psi. (13:30) 2-7/8" - 90 psi. 7" - 220 psi. 11-3/4" - 40 psi. (14:30) 2-7/8" - 100 psi. 7" - 240 psi. 11-3/4" - 34 psi. (15:30) 2-7/8" - 108 psi. 7" - 265 psi. 11-3/4" - 38 psi. (16:30) 2-7/8" - 110 psi. 7" - 241 psi. 11-3/4" - 32 psi.
16:30	17:30	Spotted slickline unit. Cleaned equipment. Work continued on secondary pumping location.
17:30	17:45	Traveled to hotel.
		B&C Houston prepared preliminary relief well plots and submitted to SCGC.

Projected Operations

Prepare secondary location.

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	11.5	0.5			
Danny Walzel	11.5	0.5			
James Kopecky	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	48

7047 W. Greens Rd.
Houston, TX. 77066
281-931-8884

HALLIBURTON — BOOTS & COOTS SERVICES

This is an estimate only for the date listed on this sheet. This is not an invoice.

Date:	19-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 26
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
					$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%.
		LEL level 25 feet from well - 0 to 100%. LEL level around equipment 0 - 65%. 2-7/8" - 138 psi. 7" - 210 psi. 11-3/4" - 28 psi.
6:30	7:00	Attended morning safety/operations meeting. Discussed cleaning equipment and moving equipment to SS-1.
7:00	13:00	Began rigging down batch mixer and pump truck. Cleaned equipment. Moved out batch mixer for cleaning. Began making up
		2-7/8" pump line from SS-1 to SS-25. Prepared SS-1 for equipment. Completed pump line.
13:00	14:00	Installed night cap with pressure gauge on SS-25. Tubing pressure 1,600 psi. Trouble shoot manifold tubing pressure gauge.
14:00	17:00	Moved 2 500 bbls frac tanks, batch mixer and HAL Elite pump truck to SS-1 Continued cleaning equipment at SS-25.
17:00	17:15	Traveled to hotel.

Projected Operations

Continue moving equipment to SS-1.

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	0.5			
Danny Walzel	11	0.5			
James Kopecky	11	0.5			
Mike Baggett	11	0.5			
				Total Man-hours for Noted Date:	46

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:	20-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	27
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
					$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%.
		LEL level 25 feet from well - 0 to 100%. LEL level around equipment 0 - 100%. 2-7/8" - 1,630 psi. 7" - 208 psi. 11-3/4" - 26 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	7:30	Placed barrier across road to pad 25 to prevent vehicles from entering. High LEL reading across road.
7:30	11:30	Modified manifold on well 25 to allow flowing 2-7/8" tubing to withdraw line.
11:30	12:00	Escorted ER team to pad 25 for assessment.
12:00	13:00	Checked pressure on Well 25A: 2-7/8" - 620 psi. 8-5/8" - 43 psi. Checked pressure on well 25B: 2-7/8" - 2,300 psi. 8-5/8" -
		1,850 psi.
13:00	17:00	Moved in 2-7/8" pump line to well 25. Continued preparing SS-1 site for pumping operations. Filled one 500 bbl frac tank with 9.4
		ppg CaCl2. Filled one 500 bbl frac tank with fresh water. Spotted additional 500 bbl frac tank. Will fill with fresh water.
		GEO Zan polymer arrived. Continued working on kill program.
17:00	17:15	Traveled to hotel.

Projected Operations

Prepare for kill.

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	0.5			
Danny Walzel	11	0.5			
James Kopecky	11	0.5			
Mike Baggett	11	0.5			
				Total Man-hours for Noted Date:	46

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:	21-Nov-2015	Well Name and Number:	Standard Senson 25 / Report # 28
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	1	John Hatteberg / Travel	1	$ 4,000.00	$ 4,000.00
General Daily Expense		D.C./ D.W. / J.K. / M.B. / J.H.	5	$ 325.00	$ 1,625.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
Hotel		J.H.	1	$ 188.40	$ 188.40
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
		Estimated Daily Total			$ 49,152.40

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%.
		LEL level 25 feet from well - 0 to 100%. LEL level around equipment 0 - 52%. 2-7/8" - 1,628 psi. 7" - 204 psi. 11-3/4" - 29 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	8:30	Rigged up Batch Mixer and Pump Truck at SS-1. Reconfigured pump line at SS 25 to pressure test lubricator at SS 25A and
		SS 25B wells.
8:30	9:30	Installed uni-bolt adapters on SS 25A and SS 25B. Completed 2-7/8" pump line tie in at SS 25.
9:30	11:30	Moved out pump truck from 25 pad. Sent to decon. Removed pump line from CT reel. Moved out man lift. Sent to decon.
11:30	12:30	Lunch.
12:30	16:30	Repositioned Pump Truck at SS-1. Tested 2-7/8" pump line to 300/4,000 psi. High test failed. Trouble shoot leaks. Tightened
		2-7/8" connections. Moved in and rigged up 40T crane at SS 25. 2-7/8" - 1,661 psi. 7" - 194 psi. 11-3/4" - 26 psi.
16:30	17:00	Attended end of the day meeting.
17:00	17:15	Traveled to hotel.
		(12:00) John Hatteberg arrived at LAX. (15:00) Arrived at hotel. Reviewed survey data. Submitted discussion points to SCGC.
		Danny Walzel and John Hatteberg will meet at SCGC Chatsworth office at 08:00 to discuss operations to date.

Projected Operations

Prepare for kill. Move in and rig up second HT400 at SS-1. Set tubing plugs in SS 25A and SS 25B. Run Gyro surveys.

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	0.5			
Danny Walzel	11	0.5			
James Kopecky	11	0.5			
Mike Baggett	11	0.5			
John Hatteberg		8			
				Total Man-hours for Noted Date:	54

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:	22-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 29
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	1	John Hatteberg / Travel	1	$ 4,000.00	$ 4,000.00
General Daily Expense		D.C./ D.W. / J.K. / M.B. / J.H.	5	$ 325.00	$ 1,625.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
Hotel		J.H.	1	$ 188.40	$ 188.40
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
Estimated Daily Total					$ 49,152.40

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. Winds predominately out of the North. Took LEL readings. LEL level at the cellar - 100%. LEL level 25 feet from well - 0 to 100%. LEL level around equipment 0 - 49%. 2-7/8" - 1,628 psi. 7" - 204 psi. 11-3/4" - 29 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	9:00	Monitor LEL levels. Began rigging up slickline to run tubing plugs in SS 25A and SS 25B. Danny Walzel and John Hatteberg met Alan Gosse and SCGC representatives at Chatsworth office to discuss relief well planning.
9:00	13:00	Well 25B: RIH with 2.3" gauge ring to 8,372 ft. Pulled out of the hole. Ran in the hole with PX plug and set at 8,372 ft. Ran and set prong.
13:00	16:15	Well 25A: RIH with 2.8" gauge ring to 8,144 ft. Pulled out of the hole. Ran in the hole with PX plug and set at 8,144 ft. Pulled out of the hole. Ran in the hole with prong. Prong did not set in PX plug. Pulled out of the hole. Tested 2-7/8" pump line to 300/,5000 psi. Test good.
16:15	17:30	Laid down lubricator. Repositioned Grease Pack Unit. Will re-run prong in the morning. 2-7/8" - 1,646 psi. 7" - 199 psi. 11-3/4" - 25 psi.
17:30	17:45	Traveled to hotel.
		John Hatteberg continued reviewing survey data. Entered data into compass. Ran anti-collision against SS 25 and relief well. Determined which wells need to be re-surveyed. Began relief well plan.

Projected Operations

Prepare for kill. Move in and rig up second HT400 at SS-1. Set prong in SS 25A. Prepare relief well plan.

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	11.5	0.5			
Danny Walzel	11.5	0.5			
James Kopecky	11.5	0.5			
Mike Baggett	11.5	0.5			
John Hatteberg	11.5	0.5			
				Total Man-hours for Noted Date:	60

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:	23-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 30
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	2	John Hatteberg / Clients Office	1	$ 5,750.00	$ 5,750.00
General Daily Expense		D.C./ D.W. / J.K. / M.B. / J.H.	5	$ 325.00	$ 1,625.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
Hotel		J.H.	1	$ 188.40	$ 188.40
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
Estimated Daily Total					$ 50,902.40

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. Winds predominately out of the South East. Took LEL readings. LEL level at the cellar - 100%.
		LEL level 25 feet from well - 0 to 24%. LEL level around equipment 0%. 2-7/8" - 1,624 psi. 7" - 202 psi. 11-3/4" - 29 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	8:30	Rigged up slickline on well SS 25A. RIH with prong. Set in PX plug at 8,144 ft. Pulled into lubricator. Bled tubing from 580 psi
		to 560 psi. Rigged down slickline. Moved in second HAL Elite pump truck to SS-1 and rigged up.
8:30	14:00	Back loaded slickline unit and equipment. Sent to decon. Back loaded injector, guide, control cab, power pack, generator, and
		tool house. Sent to decon. Rigged down 40T crane and moved out. Survey crew took surveyed surface coordinates for SS-25.
		Installed anchor chains around Well 25. Left loose.
		Moved in nitrogen truck and blew out coil tubing. Back loaded reel and sent to decon.
14:00	14:30	Pressure tested second HAL Elite pump line to 300/5,000 psi. Test good.
14:30	16:00	Anchored 2-7/8" pump line. Secured 2-7/8" pump line at pad 25 with concrete blocks.
16:00	17:00	Rigged down 100T crane and moved out. Prepared location for kill.
17:00	17:15	Traveled to hotel.
		John Hatteberg continued working on the data base, relief well directional plan. Discussed forward operations.

Projected Operations

Pump kill.

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	0.5			
Danny Walzel	11	0.5			
James Kopecky	11	0.5			
Mike Baggett	11	0.5			
John Hatteberg	11	0.5			
				Total Man-hours for Noted Date:	57.5

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:	24-Nov-2015	**Well Name and Number:**	Standard Senson 25 — Report # 31
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	2	John Hatteberg / Clients Office	1	$ 5,750.00	$ 5,750.00
General Daily Expense		D.C./ D.W. / J.K. / M.B. / J.H.	5	$ 325.00	$ 1,625.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
Hotel		J.H.	1	$ 188.40	$ 188.40
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
Estimated Daily Total					$ 50,902.40

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. Winds predominately out of the South East. Took LEL readings. Cleared location for personnel.
		2-7/8" - 1,638 psi. 7" - 199 psi. 11-3/4" - 26 psi.
6:30	7:00	Attended morning safety/operations meeting.
7:00	8:45	Prepared for pumping operations. Held PJSM.
8:45	9:45	Mixed 50 bbls GEO Zan polymer pill loaded with LCM. Mixed 35 bbls 18.0 ppg barite pill.
9:45	11:45	Pumped 50 bbl GEO Zan pill. Began pumping fresh water. Began pumping fresh water at 5 BPM. Pump pressure 1,944 psi.
		After 60 bbls pumped PP - 355 psi. Increased pump rate to 8 BPM. PP - 1,670 psi. After 80 bbls pumped increased pump rate to
		10 BPM. PP - 2,774 psi. Gas from crater increased after 90 bbls pumped. After 135 bbls pumped increased rate to 12 BPM.
		PP - 3,502 psi. Increased pump rate to 13 BPM. PP - 4,167 psi. Opened 7" choke after 850 bbls pump. 7" casing pressure
		decreased from 160 psi to 8 psi. Pumped 950 bbls water. PP - 4,067 psi. Pumped 35 bbls barite pill. Displaced out of the tubing
		with 56 bbls. Shut down. Pump pressure 0 psi.
11:45	13:00	Monitored well.
13:00	17:15	Tubing pressure increased to 76 psi. 7" - 188 psi. 11-3/4" - 27 psi. (17:15) 2-7/8" - 1,311 psi. 7" - 155 psi. 11-3/4" - 26 psi.
		At time of report recovered 700 bbls of fluid from location.
17:15	17:30	Traveled to hotel.
		John Hatteberg continued planning relief well. Updated SHL's of offset wells and target well, corrected all well elevations, made
		wall plot and anti collision report. Began working on final presentation.

Projected Operations

Pump kill.

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	11.25	0.5			
Danny Walzel	11.25	0.5			
James Kopecky	11.25	0.5			
Mike Baggett	11.25	0.5			
John Hatteberg	11.25	0.5			
				Total Man-hours for Noted Date:	58.75

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:	25-Nov-2015	Well Name and Number:	Standard Senson 25	Report # 32
Customer Name:	Southern California Gas Company	County:	Los Angeles	
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	State:	California	
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	2	John Hatteberg / Clients Office	1	$ 5,750.00	$ 5,750.00
General Daily Expense		D.C./ D.W. / J.K. / M.B. / J.H.	5	$ 325.00	$ 1,625.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
Hotel		J.H.	1	$ 188.40	$ 188.40
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
Estimated Daily Total					$ 50,902.40

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. Cleared location for personnel to begin work. 2-7/8" - 1,651 psi. 7" - 199 psi. 11-3/4" - 25 psi.
6:30	7:00	Attended morning operations/safety meeting.
7:00	8:00	Prepared for pumping operations. 2-7/8" - 1,643 psi. 7" - 200 psi. 11-3/4" - 25 psi.
8:00	11:00	Pumped 50 bbl GEO Zan pill loaded with LCM. Displaced with fresh water down tubing with 56 bbls at 5 BPM. IPP - 1,760 psi. FPP - 280 psi. Increased pump rate to 12 bpm. PP - 3,496 psi. After 60 bbls pumped increased pump rate to 13 bpm. PP - 4,173 psi. After 140 bbls pumped gas activity increased from crater. 7" - 40 psi. After 700 bbls pump water flow from crater increased. Continued pumping at 13 BPM. PP - 4,164 psi. Pumped 960 bbls of water. 7" - 17 psi. 11-3/4" - 27 psi. Pumped 100 bbls GEO Zan pill loaded with LCM. Began displacing with 9.4 ppg CaCl2 at 4 bpm. PP - 89. After 20 bbls of displacement slowed pump rate to 2 BPM. PP - 20 psi. After displacing 40 bbls slowed pump to 1 bpm. PP - 0 psi. After displacing 56 bbls shut down. 2-7/8" - 0 psi. 7" - 0 psi. 11-3/4" - 27 psi.
11:00	16:00	Flowline from 7" and tubing head broke. Nipple on well head broke. Pump line to 7" casing head broke. Fabricated valve extension handles for tubing head valve and 7" casing valves.
16:00	17:00	Closed tubing head valve and 7" casing valves.
17:00	17:30	Attended end of day meeting.
17:30	17:45	Traveled to hotel.
		John Hatteberg continued working on relief well plan and presentation. Gave presentation to SCGC. Will travel to Houston tomorrow.

Projected Operations

Secure well head. Clean location.

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	11.5	0.5			
Danny Walzel	11.5	0.5			
James Kopecky	11.5	0.5			
Mike Baggett	11.5	0.5			
John Hatteberg	11.5	0.5			
				Total Man-hours for Noted Date:	60

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:	26-Nov-2015	Well Name and Number:	Standard Senson 25	Report #	33
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Well Control Engineer	1	John Hatteberg/Transit	1	$ 4,000.00	$ 4,000.00
General Daily Expense		D.C./ D.W. / J.K. / M.B. / J.H.	5	$ 325.00	$ 1,625.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
Rental Car			1	$ 192.00	$ 192.00
					$ -
Estimated Daily Total					$ 48,964.00

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. Cleared location for personnel to begin work.
6:30	7:00	Attended morning operations/safety meeting.
7:00	15:45	Pilot tested Sodium Silicate delivered to location. Installed cables around wellhead to stabilize. Performed site work.
15:45	16:00	Attended end of the day meeting.
16:00	16:15	Traveled to hotel.
		John Hatteberg traveled to Houston, Texas.

Projected Operations

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	10	0.5				
Danny Walzel	10	0.5				
James Kopecky	10	0.5				
Mike Baggett	10	0.5				
John Hatteberg		6				
					Total Man-hours for Noted Date:	48

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:	27-Nov-2015	**Well Name and Number:**	Standard Senson 25	Report #	34
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
					$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Cleared location for personnel to begin work.
6:30	7:00	Attended morning operations/safety meeting.
7:00	12:00	Met with crane operator and discussed location to spot 100T crane. Moved in backhoe and cleared area for crane.
12:00	12:30	Lunch.
12:30	16:45	Delivered 320 track hoe to pad 25. Began clearing around well 25. Moved in man lift. Installed hand wheel on crown valve.
		Tightened hand wheel on tree wing valve. Installed pressure gauge on night cap. Checked tubing pressure. Tubing pressure
		1,600 psi. Removed whip check from 2-1/16" 5M x 1502 adapter flange.
16:45	17:15	Attended end of the day meeting.
17:15	17:30	Traveled to hotel.

Projected Operations

Rig up to flow tubing to withdraw line. Run noise/temp. Attempt to run gyro.

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	11.25	0.5				
Danny Walzel	11.25	0.5				
James Kopecky	11.25	0.5				
Mike Baggett	11.25	0.5				
					Total Man-hours for Noted Date:	47

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:	28-Nov-2015	**Well Name and Number:**	Standard Senson 25 — Report # 35
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
					$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. LEL's too high to run equipment.
6:30	7:00	Attended morning operations/safety meeting.
7:00	13:30	Monitored LEL's. Met with Onyx and Weatherford. Ordered out hoses for hydraulic choke. Identified rig up to flow tubing through hydraulic choke to test separator with the option to flow to withdraw line or open top tank. Identified rig up to flow 7" casing through secondary test separator to open top tank. Made up 50 ft of 2" 5M co-flex hose. Met with SCGC representatives to discuss rig up to flow tubing to withdraw line. Discussed installing surface safety valve on tree assembly. Discussed re-installing relief valve on withdraw line. Located relief valve for withdraw line. Relief valve will be bench tested. Located surface safety valve that was removed from SS 25. Sent for bench testing.
13:30	16:00	Winds out of the North East. Moved in track hoe and backhoe. Excavated around SS 25. Cleaned east side of location. Performed site work.
16:00	16:15	Attended end of the day meeting.
16:15	16:30	Traveled to hotel.

Projected Operations

Rig up to flow tubing to withdraw line. Run noise/temp. Attempt to run gyro.

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	10.25	0.5			
Danny Walzel	10.25	0.5			
James Kopecky	10.25	0.5			
Mike Baggett	10.25	0.5			
				Total Man-hours for Noted Date:	43

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:	29-Nov-2015	Well Name and Number:	Standard Senson 25 / Report # 37
Customer Name:	Southern California Gas Company	County:	Los Angeles
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	State:	California
		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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
					$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. LEL's too high to run equipment.
6:30	7:00	Attended morning operations/safety meeting.
7:00	12:30	Continued monitoring LEL's. Installed culvert on NW corner of Pad 25. Discussed rigging up to flow Well 25 tubing to Well 25B withdraw line. Met with SCGC personnel to discuss required equipment. Replaced block valve in withdraw line. Dug out and exposed pump in manifold. Installed additional line to secure Well 25.
12:30	16:30	Moved in man lift. Moved in and rigged up 100T crane. Repositioned E-line equipment and cleaned. Steam cleaned hydraulic choke manifold and test separators. Made up noise/temp tools. Rigged down and moved out 100T crane. Moved in back hoe. Excavated around concrete pad south of well 25. Exposed wash out. Backfilled. Located grease fittings for 2-1/16" 5M safety valve. Function tested, shell tested, and block and bleed tested to 400/5,000 psi. Tests good. Sent safety valve to welder. Instructed how to tack weld ring gaskets in place. Inspected adapter flanges to rig up to Well 25 production line. Installed relief valve on production line.
16:30	16:45	Attended end of the day meeting.
16:45	17:00	Traveled to hotel.

Projected Operations

Rig up to flow tubing to withdraw line. Run noise/temp. Attempt to run gyro.

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	10.75	0.5			
Danny Walzel	10.75	0.5			
James Kopecky	10.75	0.5			
Mike Baggett	10.75	0.5			
				Total Man-hours for Noted Date:	45

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:	30-Nov-2015	Well Name and Number:	Standard Senson 25 — Report # 37
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	Unit Charge	Total
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	James Kopecky	1	$ 10,000.00	$ 10,000.00
Sr. Well Control Engineer	4	Danny Walzel	1	$ 11,500.00	$ 11,500.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
					$ -
General Daily Expense		D.C./ D.W. / J.K. / M.B.	4	$ 325.00	$ 1,300.00
Hotel		D.C./ D.W. / J.K. / M.B.	4	$ 163.00	$ 652.00
					$ -
Rental Car			1	$ 192.00	$ 192.00
Rental Car			1	$ 103.00	$ 103.00
					$ -
					$ -
Estimated Daily Total					$ 44,447.00

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. Winds predominately out of the North. LEL's too high to run equipment.
6:30	7:00	Attended morning operations/safety meeting.
7:00	10:00	Continued monitoring LEL's. Moved in man lift. Moved in and rigged up 100T crane. Stabbed lubricator. Ran in hole with noise/temp tools.
10:00	15:30	Logged temperature to 8,390 ft. Logged noise out of the hole.
15:30	16:30	Laid down lubricator. Rigged down and moved out 100T crane. Moved out man lift.
		Continued rigging up to flow Well 25 tubing to Well 25B production line.
16:30	17:00	Attended end of the day meeting.
17:00	17:15	Traveled to hotel.

Projected Operations

Rig up to flow tubing to withdraw line. Attempt to run gyro.

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	0.5			
Danny Walzel	11	0.5			
James Kopecky	11	0.5			
Mike Baggett	11	0.5			
				Total Man-hours for Noted Date:	46

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:	16-Dec-2015	**Well Name and Number:**	Standard Senson 25 — Report # 53
Customer Name:	Southern California Gas Company	**County:**	Los Angeles
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	**State:**	California
		Country:	USA
AFE #:		**Well Location:**	Aliso Canyon Storage Facility
Customer Representative:		**Well Type:**	Gas
Report Generated By:	Jim LaGrone	**Job Type:**	Well Control
Lease - Well #:	Standard Senson 25	**Rig No:**	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
HSE Specialist	1	Mike Patton	1	$ 4,600.00	$ 4,600.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Computer Modeling	1	Arash Haghshenas	1	$ 4,600.00	$ 4,600.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
Estimated Daily Total					$ 90,401.00

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
5:30		Depart Hotel
6:35		Operations Mtg w/all service companies and Dept of Oil & Gas
		Move to location. Clean eqpt and maintenance.
		Reposition chain from west side to clean mud and debris from west side of location. Can't get to southside due to north wind
11:30		Lunch
12:00		Winds become calmer and turning to the west. Western Wireline inspects its E-Line unit
		Regulators arrive on site to access well (Dept of Oil & Gas). Operations shut down for insection
13:30		Re-install stabilizing line of wellhead to east and west side of tree. Clean Swaco gauges
		Took Man-Rider to de-contamination site for cleaning.
		Start and check air compressor
17:00		Depart for hotel
		LaGrone & Gomez attend meeting for Regulators (Dept of Oil & Gas, US EPA, Ca. OSHA; Sandia, Berkley, & Lawrence-Livermore Labs)
		to discuss pumping plan on target well and ranging concepts of relief well
		Bridge was revamped for larger span. Mud mixing plant complete. Receiving mud, should receive all by Thursday.

Projected Operations

Cut 2-7/8" tubing if wind allows

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	17-Dec-2015	**Well Name and Number:**	Standard Senson 25	Report #	54
Customer Name:	Southern California Gas Company	**County:**	Los Angeles		
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	**State:** **Country:**	California USA		
AFE #:		**Well Location:**	Aliso Canyon Storage Facility		
Customer Representative:		**Well Type:**	Gas		
Report Generated By:	Jim LaGrone	**Job Type:**	Well Control		
Lease - Well #:	Standard Senson 25	**Rig No:**	N/A		

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
		Estimated Daily Total			$ 81,201.00

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
5:30		Depart Hotel
6:45		Arrive on SS25 location. Check LEL and wind direction. Move in crane. Held Tool Box safety mtg. Used man basket
		and take 2 personnel to tree. Used long reach track hoe to assist and undo pump lines.
		Close in upper crown valve and bleed off line, remove line. Insure that wing valve on north side is shut-in and bleed off/remove line
		Remove all pump lines on manifold. Reposition 2-7/8" pump lines from Location 1. Built new dirt bridge over pump lines.
		Break down wireline lubricator. Remove pump iron hanging in cellar. Load out same to decontamination site. Send wireline eqpt to DECON
11:30		Lunch in shifts while wireline is loaded out for DECON
12:45		Stop operations to take gas samples for LA COUNTY HAZMAT AND FIRE DEPARTMENTS
13:00		WAIT ON OSHA, NO SHOW
13:30		Commence operations on cleaning south side of wellbore
14:35		SUSPEND OPERATIONS DUE TO SMALL AIRCRAFT (Cesna 172) DOING FLY-BYS VERY CLOSE TO LOCATION
14:50		Flour Eng and AE Eng representatives arrive and stand by until plane leaves
14:55		B&C takes representatives to inspect well and are looking at ideas to capture the gas coming out of the crater (Operations stopped)
15:00		Clean on east and south side of location, preparation for bridge
16:30		Secure site for evening
17:30		Travel to Hotel
		LaGrone, Gomez, Richard meet w/ Flour Eng on building a Sombrero & installing mist extractors
		LaGrone, Gomes, Richard meet w/ California OSHA and discuss safety issues with placing bridge and kill plan
		LaGrone, Richard, Clayton meet w/ Jim Fox, Shackelford and SOCAL staff on alternatives and Contingencies

Projected Operations

Install bridge across crater

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours		Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5		Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5		Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5				
Bud Curtis	11.5	0.5				
Mike Baggett	11.5	0.5				
					Total Man-hours for Noted Date:	84

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:	18-Dec-2015	Well Name and Number:	Standard Senson 25	Report #	55
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:	Jim LaGrone	Job Type:	Well Control		
Lease - Well #:	Standard Senson 25	Rig No:	N/A		

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
Estimated Daily Total					$ 81,201.00

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
5:30		Depart Hotel
6:30		Attend morning Ops meeting
6:45		Arrive on SS25 well and check LEL and wind direction, blowing from the NNW. Unable to clear debris due to strong northernly winds
		Tools taken to DECON to be cleaned. Stage junk shot manifold to SS25 site. Modified surface casing stinger sub for wellhead "A"
		Retest both pump lines from Location 1 to 300 psi LOW and 5000 psi HIGH. Good Test
12:30		Lunch
13:15		On SS25 site, check LEL's and wind direction. Move dirt to fill low places on east side. Clean remaining debris from east side
		and crater. Retighten chaines supporting tree west to east
16:00		Depart location
		Bridge is 100 % complete. As assembled, picked up for Center of Gravity (Total Weight = 15,000 lbf). Took apart the two 50 ft
		sections for transport up the hill to location. Installed pad eyes for section lift. Will be delivered to location @ 09:00 tomorrow
		B&C attend overview and troubleshooting session of options available to kill the target well from surface.

Projected Operations

Install bridge across crater

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	19-Dec-2015	**Well Name and Number:**	Standard Senson 25 — Report # 56
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:	Jim LaGrone	**Job Type:**	Well Control
Lease - Well #:	Standard Senson 25	**Rig No:**	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas	1	$ 4,600.00	$ 4,600.00
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
		Estimated Daily Total			$ 85,801.00

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
5:30		Depart Hotel
6:30		Morning Operations Mtg including Oil/Gas Regulators
6:45		Arrive on location and monitor gas and slight wind direction from the south
		Complete all dirt work to accept bridge (bury 7" kill/choke lines), which is finished down the hill
8:40		Move in 220T hydraulic crane w/ 200 ft stick.
9:40		Tool box safety meeting
10:25		1/2 of bridge arrives and position
11:00		2nd 1/2 of bridge arrives and is assembled and pull tested w/ crane
11:30		Move bridge and "straddle" Well 25. No issues. Job went smooth. Bridge was weight @ 15,000 lbm
		Remove slings from BOX of bridge
12:30		Lunch
13:00		Install additional grating onto bridge around tree to congeal oil to fall back into crater and keep out of air
14:00		Rig down crane and remov from location
15:00		Shut down operatons due to wind and rain
		Attend meeting with California O&G regulators discussing merits/risks of cutting tubing prior to jet cuttin tubing
		James Bottoms w/ Western Wireline (Bakersfield) in group meeting to discuss issues around cutting tubing while it is in 10-15 M#
		compression.
17:30		Leave location and head to hotel.

Projected Operations

Rig up for spinning magnet survey on Well 25B. This will negate the magnetic vector of a 2 nd well in the drill path. Last gyro showed well be 10 feet farther away than anticipated. Magnectic field could be corrupted w/o procedure

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	20-Dec-2015	Well Name and Number:	Standard Senson 25	Report #	57
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:	Jim LaGrone	Job Type:	Well Control		
Lease - Well #:	Standard Senson 25	Rig No:	N/A		

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas	1	$ 4,600.00	$ 4,600.00
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
Estimated Daily Total					$ 85,801.00

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
5:30		Depart Hotel
6:30		Attend Morning Operations meeting
6:45		Arrive on SS25 pad, check LEL and wind direction. Check Tbg Pressure of SS25=1318 psig
7:00		Function tested SSV (manumatic) valve off of casing valve twice (OK)
8:00		Move in HOWCO pump iron and tie into wireline pump-in tee. Drive in ground rod and ground Hatteberg's crossing
10:00		Move in 100T crane and set up for wireline. Ground same to bridge & earth
11:00		Spot gas/safe safe mono-condutor wireline unite
12:00		Lunch
12:35		Cont. RU W/L.
		Unable to run gauge ring and be off location prior to end of daylight
13:30		Leave W/L unit, drive crane down hill to DeCon area. All ready to RIH first thing in morning
		Secure well w/ turnbuckles on north side. Wellhead is stable and secure
		Cover wireline unit w/ plastic
14:00		Perorm general housekeeping. Operations suspended for evening
15:00		Inspetion of grating section to place over bridge for access and droplet collection
		Appears to be assiting in droplet coalesce size
		Relief well appears to be 2 ft from target on high side, running 4" gradient tool to determine exact distance to target.

Projected Operations

May not require spinning magnet survey of 25B (now displaced 10 ft further). Found target well 2 ft away and will run gradient tool (4") to discern exact distance this evening. Prepare for tubing cut on target well for kill

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	21-Dec-2015	Well Name and Number:	Standard Senson 25 / Report # 58
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:	Jim LaGrone	Job Type:	Well Control
Lease - Well #:	Standard Senson 25	Rig No:	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas	1	$ 4,600.00	$ 4,600.00
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
		Estimated Daily Total			$ 85,801.00

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
5:30		Depart Hotel
6:30		Attend Morning Operations meeting, wind from the south
6:40		Tubing Pressure on SS25 is 1285 psi, est BHP is 1551 psi or 3.5 ppg equivalent
7:00		Move in crane & wireline eqpt
7:30		Place cment blocks on choke line
8:30		RU lubricator and test 400# low, 4000# high. Equalize to 1300#, open crown valve and RIH w/ 2.133" Gauge ring
9:30		Tag up @ +/-100 ft. POH & remove lubricator. Rig up on 25B (offset well on same pad close to well 25 downhole)
		for spinning magnet survey. Results showed 25B is NOT interferring with Wellspot/Gradient Runs, but actually seeing 25
14:30		Finish out of hole w/ rotating magnet, 2000# on 25B
15:00		Install additional grating on bridge for coalescing purposes (grating is knocking down the oil mist)
16:00		Move slick line eqpt and glycol pump onto location. Release crane from wellsite
16:30		Reconfigure pump tie in lines to glycol line. Equalize w/ 2000 psi and pump 1 bbl of glycol into well. No "sealing" ice plug
17:15		Leave location
		Target well is 13 ft away at TD and 18 deg left of high side

Projected Operations

Will rig up to pump 300 bbl of 15 ppg mud down tubing, the middle 100 bbl will be laced w/ diatomacious earth and nutplug. If on losses, will maintain losses 1/4-1/2 BPM of 15 ppg

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	22-Dec-2015	**Well Name and Number:**	Standard Senson 25 — Report # 59
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:	Jim LaGrone	**Job Type:**	Well Control
Lease - Well #:	Standard Senson 25	**Rig No:**	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas (arrived)	0	$ 4,600.00	$ -
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
		Estimated Daily Total			$ 81,201.00

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
5:30		Depart Hotel
6:30		Attend Morning Operations meeting, wind from the south/west variable w/ lots of fog, frequently can't see kill location
7:10		Arrive and site check wind and LEL. Clear location for Western Wireline to pump glycol. Tubing pressure is 1215 psi
		Equalize across crown valve, open same. Pump 1.5 bbl of glycol @ 7 gpm. Tubing pressure dropped to 1140 psi
8:00		Close wellhead, bleed off lines and remove chem injection pump. Call HOWCO and inform SS 25 ready for pump line test pressure
9:00		Site safety meeting
9:10		Begin Pump Line test 400 psi Hi/ 5000 psi low. While bleeding back from 5M# high @ 1200 psi, chicksan o-ring leaking on location
		Change out loop/bale
9:50		Repeat test 400/5000 with 5/10 min test, respectively. All OK
10:10		Began kill w/ 300 bbl of all WBM at 15.1 ppg at 5 BPM (100 bbl of mud, 100 bbl mud w/ 125#/bbl mud & 30 ppb Nutplug, 100 bbl of mud)
10:15		Pumping at 5 BPM thru entire job. 40 bbl gone, 150 psi on pump, 13 psi on wellhead
10:20		60 bbls pumped 200 psi
10:22		70 bbs gone, 200 psi, mud/oil mist in crater
11:05		300 bbl gone, pumps off, slow rate via low torgque to 1/2 BPM (max pressure 400 psi, min 120 psi, flat lined at 260 psi on last 60 bbl)
11:20		shut down all pumping due to rocking of wellehad and unloading mud from crater, very little formation. Similar as before
		but w/ much less fluid (mud) to surface due to 15# mud weight
13:28		Tubing pressure rose from zero to 248 psi, well contiuing to unload dehydrated/clabbarded mud
14:00		Pump line to top TEE broke off due to movement of wellehad. Close LowTorque bale on pump line to isolate manifold. Monitor well
14:30		Gather sample of mud ejected from crater. Well began to settle down, clabbard mud still being ejected
15:30		Secure well site and Demob all personnel

Projected Operations

Secure well: Tighten lines and add additional and wait on weather for wireline evaluation

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	23-Dec-2015	Well Name and Number:	Standard Senson 25 | Report # 60
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:	Jim LaGrone	Job Type:	Well Control
Lease - Well #:	Standard Senson 25	Rig No:	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas (arrived)	0	$ 4,600.00	$ -
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
Estimated Daily Total					$ 81,201.00

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
5:30		Depart Hotel
6:30		Attend Morning Operations meeting, high wind from the north
7:10		Arrive on site and check wind and LEL's. Access to determine best way to clear debris. Crater has grown 5 ft wider and 12 ft to the north
		Later inspection showed south side of crater had large and deep hole due to 11-3/4" casing outlet. Mark safety zone on surface.
7:30		Check tbg pressure at chemical pump, 750 psi. Attempt to close valve on tree of injection tee. Grating had moved and restricted
		valve access. Isolate HOWCO pump line at well and attemp to bleed off. Couldn't bleed off, valve possible cut out
8:30		Close valve on tree by taking off handle and closing with wrench. Bleed from 800 psi to 600 psi on Tee pump line manifold.
9:00		Decide to bleed pump line at Location 1 (where HOWCO cmt trucks are)
9:50		Line up valves on Location 1, bleed same.
10:00		Check all lines on SS25 and confirm they are bled off
10:30		Clear Western Wireline to demob eqpt
11:30		Disconnect chemical inj line from pump manifold
12:30		Lunch
13:00		Wind not favorable to bring crane down to load out quipment
14:00		Continue to rig down eqpt. Kill power to site and disconnect electric wireline unit. Reconfigure power to Location 9 site down hill.
15:15		Hook T&T tractor to electric line float and remove from site
15:30		Secure and clear site of all peronnel

Projected Operations

Clear and secure site for wireline operations - noise/temp and tubing caliper

Approvals

Signature Customer Representative	Print Name	Date
Signature Boots and Coots Representative	**Print Name**	**Date**
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	24-Dec-2015	**Well Name and Number:**	Standard Sesnon 25 / Report # 61
Customer Name:	Southern California Gas Company	**County:**	Los Angeles
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	**State:** **Country:**	California USA
AFE #:		**Well Location:**	Aliso Canyon Storage Facility
Customer Representative:		**Well Type:**	Gas
Report Generated By:	Jim LaGrone	**Job Type:**	Well Control
Lease - Well #:	Standard Senson 25	**Rig No:**	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas	0	$ 4,600.00	$ -
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
		Estimated Daily Total			$ 81,201.00

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
5:30		Depart Hotel
6:30		Morning Operations Mtg
7:00		Check wellsite for LEL's. Bring in eqpt operator to clear debris. Strong wind from the north
7:30		Pull grating skid from north end of bridge. Clear mud & debris off of bride from north and east side of bridge. Clean north bridge walk
9:30		Pull up hydraulic hoses and steel line for pressure sensor and SSV
10:30		Move in crane after wind stalled. Load out all remain W/L equipment
		Continue clearing mud off of bridge from east side of bridge. Remove skid grating from south end of bridge
11:50		Lunch
12:30		WO California OSHA for permission to return to work
13:40		Return to site, wind from the West, OK given from Cal OSHA
14:00		Flour eng visit site to access gas recovery. Continue cleaning mud (dehydrated and sticky/heavy) and debris from south and east side
		of bridge. Clear mud off of Xmas tree and haul off grating platforms for cleaning
		Haul off VOC bin full of debris
16:00		Secure site and demob site of all peronel
		Merry Xmas to all, and to all a good night

Projected Operations

Clear and secure site for wireline operations - noise/temp and tubing caliper

Approvals

Signature Customer Representative	Print Name	Date

Signature Boots and Coots Representative	Print Name	Date
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	11.5	0.5	Jim LaGrone	11.5	0.5
Travis Martel	11.5	0.5	Rolly Gomez	11.5	0.5
Danny Clayton	11.5	0.5			
Bud Curtis	11.5	0.5			
Mike Baggett	11.5	0.5			
				Total Man-hours for Noted Date:	84

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:	25-Dec-2015	**Well Name and Number:**	Standard Sesnon 25 — Report # 62
Customer Name:	Southern California Gas Company	**County:**	Los Angeles
Customer Billing Address:	12801 Tampa Ave., SC 9328 Northridge, CA, 91326	**State:**	California
		Country:	USA
AFE #:		**Well Location:**	Aliso Canyon Storage Facility
Customer Representative:		**Well Type:**	Gas
Report Generated By:	Jim LaGrone	**Job Type:**	Well Control
Lease - Well #:	Standard Sesnon 25	**Rig No:**	N/A

Description of Charges:	Level	Comments	Units	Unit Charge	Total
Sr. Well Control Specialist	4	Richard Hatteberg	1	$ 11,500.00	$ 11,500.00
Well Control Specialist	4	Travis Martel	1	$ 10,000.00	$ 10,000.00
HSE Specialist	4	Mike Baggett	1	$ 9,200.00	$ 9,200.00
Sr. Well Conrol Engineer	4	Jim LaGrone	1	$ 11,500.00	$ 11,500.00
Sr. Well Conrol Engineer	4	Rolly Gomez	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Danny Clayton	1	$ 11,500.00	$ 11,500.00
Sr. Well Control Specialist	4	Bud Curtis	1	$ 11,500.00	$ 11,500.00
Houston Engineering Support	1	Arash Haghshenas	0	$ 4,600.00	$ -
General Daily Expense	1		7	$ 325.00	$ 2,275.00
Hotel			7	$ 163.00	$ 1,141.00
Equipment		Junk Shot Manifold Stby	1	$ 530.00	$ 530.00
Rental Cars			3	$ 185.00	$ 555.00
Estimated Daily Total					$ 81,201.00

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
5:30		Depart Hotel
6:30		Morning Operations Mtg
6:45		Arrive on site and check wind and LEL levels. Strong wind from the north. Clean grating skid on north side of well. Cover with
		steel mesh (mist extractor) to catch oil droplets/mist in gas flow. Clean mud and debis off of NW side. Clean second grating of mud
		Install and strap down full length w/ SS316 mist extractor mesh. Wind unfavorable to work on south side w/ crane
14:00		Secure site and travel to hotel

Projected Operations

Clear and secure site for wireline operations - noise/temp and tubing caliper

Approvals

Signature Customer Representative	Print Name	Date
	Mike Dozier	

Signature Boots and Coots Representative	Print Name	Date
	Jim LaGrone	

Employee Name	Hours on Location	Travel Hours	Employee Name	Hours on Location	Travel Hours
Richard Hatteberg	8	0.5	Jim LaGrone	8	0.5
Travis Martel	8	0.5	Rolly Gomez	8	0.5
Danny Clayton	8	0.5			
Bud Curtis	8	0.5			
Mike Baggett	8	0.5			
				Total Man-hours for Noted Date:	59.5

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

Table of Contents

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.

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

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	

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

AC_CPUC_0036138

SED_RT_0167

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 corrosion
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

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	Submitte d 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**		

SOUTHERN CALIFORNIA GAS COMPANY

BLADE ENERGY PARTNERS
REQUEST FOR INFORMATION DATED FEBRUARY 18, 2018

SOCALGAS AMENDED RESPONSE DATED MARCH 22, 2019

SoCalGas provides this information in response to the request for information from Blade Energy Partners, dated February 18, 2018. This information 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.

DATA REQUESTS

This is a request for information collected as part of the SIMP casing/integrity program.

Question 2:

Have there been instances of casing with longitudinal or circumferential through wall defects identified by logs or visual inspection? If so, please provide the well name, the description of the failure, casing size, casing weight, casing grade, casing connection, etc. Also provide all daily reports, failure reports and documentation related to the failure analysis.

Response 2 (March 23, 2018):

Well Name	Casing Size, Weight, and Grade	Casing Connection Type	% Wall Loss	Description
Standard Sesnon 44A	8 5/8", 36#, K55/N80	BT&C	N/A	Caliper log indicates potential surface casing through-wall defects at 90' and 225'.
Standard Sesnon 44A	8 5/8", 36#, K55/N80	BT&C/LT&C	~100%	Visually identified a longitudinal split in the production casing.
Mission Adrian 1B	8 5/8", 36/40#, N80	BT&C	~100% at 1590'	Longitudinal through-wall defect in production casing at 1590'.
Porter 32	7", 23-29#, J55/N80	Speedtite	~100% at 5417'	Through-wall defect in production casing at 5417'.
Porter 44	7", 23-26#, N80/J55/S95	T&C	~100% at 4004'	Through-wall defect in production casing at 4004'
Porter 69A	9 5/8", 43.5-53.5#, N80	BT&C + LT&C	~100% at 7414'	Through-wall defect in production casing at 7414'.

For reports and documentation related to the failure analysis, see the following electronic documents:

SOUTHERN CALIFORNIA GAS COMPANY

BLADE ENERGY PARTNERS
REQUEST FOR INFORMATION DATED FEBRUARY 18, 2018

SOCALGAS AMENDED RESPONSE DATED MARCH 22, 2019

Well Name	Bates Range
Standard Sesnon 44A	AC_BLD_0067777 – AC_BLD_0067784
Mission Adrian 1B	AC_BLD_0067591 – AC_BLD_0067625
Porter 32	AC_BLD_0067626 – AC_BLD_0067674
Porter 44	AC_BLD_0067675 – AC_BLD_0067719
Porter 69A	AC_BLD_0067720 – AC_BLD_0067776

<u>Amended Response 2 (March 22, 2019):</u>

Upon further review and analysis, the vendor determined it is unlikely there was a through-wall defect in the casing of Porter 69A at the time of logging in 2017. The vendor has provided a revised USIT log report dated (please see electronic documents with Bates Range AC_BLD_0124086 - AC_BLD_0124122).

Well Name	Casing Size, Weight, and Grade	Casing Connection Type	% Wall Loss	Description
Standard Sesnon 44A	8 5/8", 36#, K55/N80	BT&C	N/A	Caliper log indicates potential surface casing through-wall defects at 90' and 225'.
Standard Sesnon 44A	8 5/8", 36#, K55/N80	BT&C/LT&C	~100%	Visually identified a longitudinal split in the production casing.
Mission Adrian 1B	8 5/8", 36/40#, N80	BT&C	~100% at 1590'	Longitudinal through-wall defect in production casing at 1590'.
Porter 32	7", 23-29#, J55/N80	Speedtite	~100% at 5417'	Through-wall defect in production casing at 5417'.
Porter 44	7", 23-26#, N80/J55/S95	T&C	~100% at 4004'	Through-wall defect in production casing at 4004'

For reports and documentation related to the failure analysis, see the following electronic documents:

Well Name	Bates Range
Standard Sesnon 44A	AC_BLD_0067777 – AC_BLD_0067784
Mission Adrian 1B	AC_BLD_0067591 – AC_BLD_0067625
Porter 32	AC_BLD_0067626 – AC_BLD_0067674
Porter 44	AC_BLD_0067675 – AC_BLD_0067719

CPUC-SAFETY AND ENFORCEMENT DIVISION AND DEPARTMENT OF CONSERVATION- DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES DATED JANUARY 26, 2016

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, and is subject to change as investigation continues and new information becomes available. SoCalGas reserves the right to amend or supplement this information as its investigation continues. Please note that this is a partial production, and additional documents and information will provided on a rolling basis as our investigation continues. All requests not specifically responded to below will be supplemented on a rolling basis. We reserve the right to request confidential treatment for any document inadvertently produced herein that should be treated as confidential under applicable CPUC rules.

As set out more specifically below, this production includes documents responsive to the following data requests:

- All “A” requests (Detailed Well Data for SS-25)
- All “B” requests (Abnormal Conditions Data for SS-25)
- All “C” requests (Construction - SS-25, 25A, and 25B)
- D1
- D2 (to the extent applicable to 25-A and B)
- D4
- D5
- D6
- E1
- All “H” requests (Operations and Maintenance)

<u>Detailed Well Data – “Standard Sesnon” 25 (SS-25) (API 037-00776)</u>

<u>Question 1:</u>
All well records.

<u>Response 1:</u>

Please see enclosed electronic document production set for copies of all documents comprising the active SS-25 well file, documents Bates range AC_CPUC_0000023 - AC_CPUC_0000759

<u>Question 2:</u>

Complete history of well SS-25 from drilling to the date of the well failure; including, but not limited to, all permanent and non-permanent alteration of casing, all tubing, packer, subsurface safety valves, plugs, sliding sleeve, perforations, cementing and remedial operations, logs.

Response 2:

Please see response to A1.

Question 3:

A description of all remedial operations, when conducted, and for what purpose. (include all non-permitted and permitted operations.) Provide copies of the daily report of well operations (engineer's log) for each well operation.

Response 3:

Please see response to A1.

Question 4:

Information on the current subsurface safety valve (SSSV) installed in the well.

a. Depth and date the current SSSV was installed. If the SSSV was installed in 1979, provide the history. If a SSSV was required, please provide documentation.
b. A recorded description of the purpose and function of the current SSSV. Document description of the current SSSV.
c. Manufacturers specification/design sheet of all SSSVs assemblies used historically on SS-25
d. The narrative reason for installation of a SSSV in SS-25.
e. Manufacturer's specifications of the SSSV currently in the well.

Response 4:

Question 5:

Historical operational narrative overview of ALL SSSVs

a. Include original SSSVs installed or removed, decommissioned in place, replaced, and repaired.
b. Why are SSSVs installed in SS-25?
c. Manufacture specifications All SSSVs installed or removed, decommissioned in place, replaced, and repaired.
d. maintenance history and issues
e. Functionality or improvements needed

Response 5:

Question 6:

The operational history of the current SSSV, including maintenance history and any problems.

a. Whether or not the SSSV was functioning as designed prior to the well failure. If not, reason why.
b. Provide all correspondence between SoCalGas and DOGGR related to the SSSV since 1977.

Response 6:

See response to A1.

Question 7:

Describe the operational design of injection and withdrawal mechanisms for well SS-25.
a. What was the injection/withdrawal plan for the past 10 years?
b. Was gas injected through tubing and packer?
c. Was gas injected through tubing and tubing/casing annulus simultaneously?
d. Describe the mechanism for gas withdrawal in well SS-25. Was gas withdrawn through tubing and casing?
e. Provide technical analysis for injection and withdrawal through the tubing/casing annulus. Why is this injection and withdrawal method used instead of tubing only? Was this method approved for injection? If so, provide documentation.
f. Describe the stress on the casing of annual cycles of injection and withdrawal through casing?

Response 7:

Question 8:

Casing diagram detailing the physical condition of the well at the time of the well failure (October 23, 2015) including all subsurface equipment, tubing, packers, subsurface safety valves (SSSV), sleeves, etc.
a. Details should include, and not limited to: size and depth of holes, casing, tubing, packer, perforations, casing centralizers, cement ports, cement, fish, stubs, plugs, etc. Casing diagram shall include the location of corrosion, well failures, repairs, remedial cementing operations, base of fresh water, base of USDW, lost circulation zones, tops of formations, markers, faults, etc.
b. All data shall be clearly marked on the wellbore drawing and at a scale that is proportional and easy to read. The wellbore diagram shall be in pdf format no less than 300dpi.
c. Detailed information should be listed in a column next to the wellbore schematic.

Response 8:

See response to A1.

Question 9:

Details of surface wellhead, pressure gauges, and valves, and their function. Include:

a. Wellhead equipment schematics, include manufacture's specifications.
b. Recent, within 3 years, wellhead equipment changes
c. Type and purpose of safety valves. Their testing schedule and results of tests.

Response 9:

See response to A1.

Question 10:

History of all well leaks, surface and subsurface, since SS-25 was placed on production and later on injection/withdrawal.

a. Provide depth of casing collars, and problems with casing threads.
b. Documentation of the location of the leak on the 7" casing and cause.

Response 10:

See response to A1.

B. Abnormal Conditions Data – "Standard Sesnon" 25 (SS-25) (API 037-00776)

Question 1:

A narrative identifying, describing and analyzing any problems encountered during operational history of the well.

Response 1:

Question 2:

Any casing failures, ruptures, holes, corrosion and their location on the well.

Response 2:

Insofar as this request seeks production of documents, see A1.

Question 3:

History of all well leaks, surface and subsurface, since SS-25 was placed on production

Response 3:

Insofar as this request seeks production of documents, see A1.

Question 4:

Records of history of safety concerns, near misses, upset conditions, outside forces near misses, incidents, failures or any concerns for the operational safety and integrity of SS-25.

Response 4:

See response to A1.

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:

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.

Question 2:

SS-25, S-25A, SS-25B: Provide any and all well drilling logs since well inception

Response 2:

Please see responses to A1 and C1.

Question 3:

SS-25: Provide any and all well packer seating and unseating(s), changes, reworks, replacements, etc., whether required for DOGGR inspection or not.

Response 3:

Please see responses to A1 and C1.

D. Tests

Question 1:

All mechanical integrity tests run on well SS-25 since 1976, including, but not limited to, casing pressure test, noise logs, temperature logs and radioactive tracer surveys. Include whether or not each test was required by DOGGR.

a. Provide the date of each MIT run and results of the test. Include all Temperature and noise logs for SS-25; include an explanation of all acronyms used. Include the smoothing and sample rate of each log. If available, provide the temperature logs in ASCII/LAS files.

b. Provide records of MIT evaluations for SS-25.

c. Provide all documentation of monitoring from 1979 to October 2015. (Refer to remarks on the 1989 temperature survey.)

d. In the 1989 temperature log there is an anomaly. Provide information on the anomaly and steps taken to identify the cause. Describe the relationship between the anomaly and the SSSV in the well at the time.

e. In 1991 noise log there is reading. Provide record information on the anomaly and record of steps taken to identify the cause and further investigation and/or mitigation. Describe the relationship between the anomaly and the SSSV in the well at the time.

Response 1:

Please see response to A1.

Question 2:

All mechanical integrity tests run on gas storage wells, including idle and abandoned, located within 1/4 mile of well SS-25, and the results of the tests. If available, provide the tests in ASCII/LAS files.

a. What was the required frequency for conducting temperature surveys and other MITs?

b. What were the reasons for running a particular type of survey?

c. What is the frequency for measuring annulus pressure? Provide a history of annulus pressures.

d. What is the requirement for running noise logs and radioactive tracer (RA) surveys? Provide a history of noise logs and RA surveys.

e. What is the required frequency of reservoir shut-in periods to measure static bottom-hole pressure? Provide a history of reservoir shut-in period and static bottom-hole pressure measurements.

f. Who runs and provides oversight of the MIT field test? What are their qualifications?

g. How MITs were evaluated during and after the field test (provide any written report).
h. For failed or questionable MITs, at what depth and date were anomalies determined?
i. Were wells remediated if the MIT failed? If DOGGR was notified, please provide date, contact person, and type of communications.
j. Most recent fluid levels for wells within ¼ mile of SS-25. Include the method used to determine fluid level.
k. Data detailing pressure communication between wells.
l. Any data collected or study conducted by SoCalGas on the effects of wells subject to expansion and contraction during gas cycling in Aliso Canyon Gas Storage project. Provide findings and recommendations for evaluating integrity of wells in the project and risks of long term use of wells.

Response 2:

Please see responses to A1 and C1.

Question 3:

Tests for corrosion potential of all fluids encountered in well SS-25 and corrosion management plan incorporated into the design and operation of wells in the GS projects with 1 mile of well SS25.

Response 3:

Please see responses to A1 and C1.

Question 4:

SS-25, S-25A, SS-25B: Provide any and all well water noise logs in scale readable format (1"=200)

Response 4:

Question 5:

SS-25, S-25A, SS-25B: Provide any and all well water temperature logs in scale readable format (1"=200)

Response 5:

Please see responses to A1 and C1.

Question 6:

SS-25, S-25A, SS-25B: Provide any and all well ion logs in scale readable format (1”=200)

Response 6

Please see responses to A1 and C1.

E. Injection Pressure

Question 1:

Surface injection pressure (preferably daily) and flow rate for well SS-25 for the past 10 years.

a. Wellbore deviation angle (from directional survey)
b. Pipe inside diameter
c. Temperature of the gas injected at the surface
d. Reservoir temperature and depth
e. Gas gravity

Response 1:

Please see response to A1

Question 2:

For SS-25, is the pressure gauge permanently installed or portable type? Please provide calibration schedule and any calibration documentation.

Response 2:

Question 3:

Did SS-25 well ever inject above MASP? What is the design pressure limit of the reservoir, wells, and wellhead?

Response 3:

Question 4:

For the monthly surface injection pressure data for gas storage wells, submitted to DOGGR:

a. How is the rate calculated? Is it based on 30-day average?
b. Is the Tubing or Casing pressure?

Response 4:

Question 5:

Provide daily and monthly injection tubing and casing pressure and rate for SS-25 since initial injection.

Response 5

Please see response to A1

F. Gas Storage Monitoring Program:

Question 1:

Provide a copy of the gas storage project well monitoring program.

Response 1:

Question 2:

Has the monitoring program changed over time? If so, describe the changes.

Response 2:

Question 3:

SS-25: Provide any and all well pumping logs for life of well

Response 3:

Please see response to A1

G. Communication History:

Question 1:

All correspondence between SoCalGas and the DOGGR Ventura district office, related to Aliso Canyon GS project, including, but not limited to, field inspections, well integrity testing, rework operations, notices, permits, removal and installation of the SSSV and the sliding sleeve.

Response 1:

Question 2:

Provide dates MIT survey results were submitted to the DOGGR Ventura office since 1989.

Response 2:

Question 3:

How did SoCalGas communicate with DOGGR before, during, and after running MITs for GS wells? If DOGGR was notified, please provide date, contact person, subject, and type of communications (e-mails, letters, phone-calls, etc.).

Response 3:

Question 4:

Provide list of communications (e-mails, letters, and phone calls) made by SoCalGas to the DOGGR Ventura district office specific to the SS-25 well failure, prior to start of remedial operations. Include the date, time, subject, contacts and message.

Response 4:

H. Operations and Maintenance:

Question 1:

SS-25, S-25A, SS-25B: Provide any and all maintenance, repair and improvement records since well inception

Response 1:

Please see responses to A1 and C1.

Question 2:

SS-25, S-25A, SS-25B: Provide any and all well Operations and Maintenance records since well inception

Response 2:

Please see responses to A1 and C1.

Question 3:

SS-25, S-25A, SS-25B: Provide any and all well related management directives, analysis, investigations

Response 3:

Please see responses to A1 and C1.

Question 4:

SS-25, S-25A, and SS-25B: Provide any and all well water circulation, fluid levels, and annular reading records for life of each well.

Response 4:

Please see responses to A1 and C1.

Question 5:

SS-25: Provide any and all well records cathodic, sacrificial plan and corrosion monitoring records of life of well.

Response 5:

Please see response to A1.

Question 6:

SS-25: Provide any and all well cathodic, sacrificial plan and monitoring records of life of well.

Response 6:

Please see response to A1.

Question 7:

SS-25: Provide any and all well fluid compatibility records of life of well

Response 7:

Please see response to A1.

Question 8:

SS-25: Provide any and all well fluids, formation fluids, corrosion due to fluid monitoring records of life of well

Response 8:

Please see response to A1

I. Materials

Question 1:

Explain and show historical documents that convey procedures for:

a. Provide record of review for integrity of SS-25 casing, concrete casing for well surface casing and production casing as inherited by SoCalGas circa 1973.
b. Provide record of review for inherited surface casing, circa 1973 forward, establishing set elevation as functionally sound set at approximately 990'.
c. When setting casing, what determines the set depth? Provide a specific example sourced from records you provide to us as requested elsewhere, herein.
d. How does the depth depend on the loss of circulation?
e. Explain difference between casing material
f. What is grade(s) of steel are presently used for outer casing?
g. If different from aged wells, when did the industry change and why (cite all factors, technology/reference new codes and regulations/new standards of practice)?

Response 1

Please see response to A1

Question 2:

Explain the historical mixing and setting of casing mix. [DR] SS-25, S-25A, SS-25B

a. 1 dry sack of Diamix(or equal) cement = (equals) how many cf wet (casing) cement mix.
b. Neat cement same?
c. Installation/pumping records
d. Specify equipment used, hose size to install casing cement
e. Hole fill methodology; how is the cement mixture installed based on casing depth?

Response 2:

Question 3:

Provide narrative identifying, analyzing and describing "sidetracking a hole" in gas and oil terms? Provide records referenced to complete narrative.

a. Identify historical narrative of events of this occurring in SoCalGas drilling operations on SS-25, SS-25A, SS-25B since inception of these wells.
b. Identify elevations of occurrence.
c. What corrective actions took place?

J. Well Life

Question 1:

SS-25 historical decommission plans and monitoring

a. Prior to October of 2015, provide records of how well was to be permanently inoperable and sealed.
b. Provide narrative and records of projected well abandonment plan.

Response 1:

Please see response to A1

Question 2:

Provide evaluation records of well facility as inherited. What expected lifespan was given based on the age of well, former operation as an oil well.

Response 2:

Please see response to A1

Question 3:

Provide record of well diagnostics at time of SoCalGas conversion. Condition of casings, concrete, corrosion, etc.

Response 3:

Please see response to A1

Question 4:

Provide monitoring, cleaning and pumping records of storage sands, tag sands, fill sands, etc.

a. Provide diagnostics and analysis of sand draw
b. Provide critical events signaling beginning well decommissioning phase.

Response 4:

Please see response to A1

K. Geology-Topography

Question 1:

Provide all recorded seismic event records at Site SS-25, SS-25A, SS-25B since inception

Response 1:

Please see responses to A1 and C1

Question 2:

Provide all seismic event related inspections at Site SS-25, SS-25A, SS-25B.

a. Standard SoCalGas inspections
b. Third party inspections
c. Contractors – tools used, contracts, scope of
d. Expert consultants – scope, reports

Response 2:

Please see responses to A1 and C1

Question 3:

Provide records for all seismic repairs and replacements

Response 3:

Please see responses to A1 and C1

Question 4:

Provide all topographic surveys at SS-25, SS-25A, SS-25B.

Response 4:

Please see responses to A1 and C1

Question 5:

A type log showing the character and depth of the formations, formation tops, marker beds, correlations, fault picks, other geologic features.

a. Preferably on an SP and resistivity curve.
b. Include Gamma Ray, density, neutron, and sonic curves, if available.

Response 5:

Question 6:

All logs, including but not limited to, e-logs (SP and resistivity), gamma, and density neutron, in pdf (300dpi). If available, log data in LAS format on an excel spreadsheet, of any e-log and gamma ray logs run on the SS-25 well or any wells in the vicinity. All logs shall have elevation references, preferably in mean sea level.

Response 6:

Please see responses to A1 and C1

Question 7:

Geologic structure map of the area within a 1 mile radius of well SS-25, including faults, and other geologic features.

Response 7

Question 8:

Geologic cross-section clearly detailing the geology, formations, structure, faults, and identifying base of freshwater, base of USDWs, all oil and gas bearing zones, and wells. The cross-section shall be drawn incorporating the SS-25 well and include the gamma or elog traces used for correlation.

Response 8:

Question 9:

Contour map (1 mile radius of well SS-25) of the top of the gas storage reservoir (Sesnon Frew formation).

Response 9:

Question 10:

Isopach map of the gas storage reservoir extending in a 1 mile radius of well SS-25.

Response 10:

Question 11:

A surface map identifying all (active and inactive) wells within a 1 mile radius of well SS-25, labeled with the API number and current operational status, such as: OG (oil/gas producer), GS (Gas storage), idle, abandoned, OB (observation), WF (water flood), WD (water disposal). Including any other wells types not listed.

Response 11:

Question 12:

Was SS-25 affected by the Northridge earthquake? What analysis was conducted to evaluate whether the earthquake affected the well. Were any wells in the area affected?

Response 12:

Question 13:

All maps and cross-sections shall include direction, scale, elevation and references clearly marked. Submitted in electronic pdf format (300dpi) so it can be expanded without blurring details. Most useful scale must show locations and distances accurately and small enough to read data for the purpose it was intended.

Response 13:

Question 14:

Provide reports of all Geotechnical studies conducted in the Aliso Storage Reservoir

Response 14:

Question 15:

Provide SCG analysis of the study and subsequent actions

Response 15:

Question 16:

Provide any and all water level/circulation log records for SS-25, SS-25A, SS-25B

Response 16:

Please see responses to A1 and C1.

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.

<u>Question 11</u>:

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?

<u>Response 11</u>:

Yes.

<u>Question 12:</u>

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.

<u>Response 12:</u>

Please see electronic documents with Bates range AC_CPUC_SED_DR_27_0000001 - AC_CPUC_SED_DR_27_0000064.

<u>Question 13:</u>

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.

<u>Response 13:</u>

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.

<u>Question 14:</u>

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.

<u>Response 41:</u>

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.

WORK ORDER #: **3839816** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: Completed.

TARGET START DATE: 11/1/2009
TARGET COMP DATE: 11/30/2009
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 11/4/2009
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/04/2009 DATE COMPLETED: 12/01/2009

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	2.00	0.00	12/01/2009

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3839816** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3839816** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3839816** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3839824** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: see remarks will issue maximo

TARGET START DATE: 12/1/2009
TARGET COMP DATE: 12/31/2009
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 11/4/2009
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/23/2009 DATE COMPLETED: 12/29/2009

EST. Labor HRS: 0.00
ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	3.00	0.00	12/29/2009

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3839824** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3839824** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3839824** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3839832** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: COMPLETED

TARGET START DATE: 1/1/2010
TARGET COMP DATE: 1/31/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 11/4/2009
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 12/14/2009 DATE COMPLETED: 02/03/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	3.00	0.00	02/03/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3839832** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3839832** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3839832** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3864286** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: COMPLETE SEE ATTACHMENT

TARGET START DATE: 2/1/2010
TARGET COMP DATE: 2/28/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 12/4/2009
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 02/03/2010 DATE COMPLETED: 03/03/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	2.00	0.00	03/03/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3864286** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3864286** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3864286** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3901405** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: complete

TARGET START DATE: 3/4/2010
TARGET COMP DATE: 4/2/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: TP1CJV
REPORT DATE: 1/5/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 02/22/2010 DATE COMPLETED: 03/31/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	4.00	0.00	03/04/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3901405** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3901405** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3901405** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3928070** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: see remarks

TARGET START DATE: 4/1/2010
TARGET COMP DATE: 4/30/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 2/12/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 03/23/2010 DATE COMPLETED: 04/28/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	2.00	0.00	04/28/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3928070** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3928070** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3928070** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3944058** PMNUM: **AC-OPSC2**
PARENT WO #:
DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: complete

TARGET START DATE: 5/1/2010
TARGET COMP DATE: 5/31/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 3/12/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 04/27/2010 DATE COMPLETED: 05/27/2010

EST. Labor HRS: 0.00
ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	4.00	0.00	05/01/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3944058** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3944058** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3944058** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3974770** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 6/1/2010
TARGET COMP DATE: 6/30/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 4/12/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 05/24/2010 DATE COMPLETED: 07/04/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	4.00	0.00	07/04/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3974770** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3974770** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3974770** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **3984256** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: Found vavle leaks at P26ARef. sub W/O 4063333...
Valve ACW-P26A-05 leaking at GBF.

TARGET START DATE: 7/1/2010
TARGET COMP DATE: 7/31/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/7/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 06/22/2010 DATE COMPLETED: 07/31/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	4.00	0.00	07/31/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **3984256** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **3984256** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **3984256** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4019999** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: Complete see attachment

TARGET START DATE: 8/1/2010
TARGET COMP DATE: 8/30/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 6/4/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 07/26/2010 DATE COMPLETED: 08/29/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	2.00	0.00	08/29/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4019999** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4019999** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4019999** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4042121** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: COMPLETE SEE ATTACHMENT

TARGET START DATE: 9/1/2010
TARGET COMP DATE: 9/30/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 7/6/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 08/26/2010 DATE COMPLETED: 09/30/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.50

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1KJJ	STATECH	2.00	0.00	09/25/2010
	TP1KJJ	STATECH	2.00	0.00	09/26/2010
	CGATDULA	STATECH	0.50	0.00	09/30/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4042121** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4042121** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4042121** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4069251** PMNUM: **AC-OPSC2**
PARENT WO #:
DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 10/1/2010
TARGET COMP DATE: 10/31/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 8/13/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 09/24/2010 DATE COMPLETED: 10/24/2010

EST. Labor HRS: 0.00
ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	4.00	0.00	10/24/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4069251** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4069251** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4069251** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4092806** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 11/1/2010
TARGET COMP DATE: 11/30/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 9/10/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 10/20/2010 DATE COMPLETED: 11/03/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 9.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	3.00	0.00	11/03/2010
	TP1KJJ	STATECH	3.00	0.00	11/03/2010
	TP1RXL	STATECH	3.00	0.00	11/03/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4092806** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4092806** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4092806** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4101027** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: COMPLETE SE ATTACHMENT

TARGET START DATE: 12/1/2010
TARGET COMP DATE: 12/31/2010
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 10/8/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/17/2010 DATE COMPLETED: 12/28/2010

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CGATDULA	STATECH	2.00	0.00	12/28/2010

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4101027** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4101027** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4101027** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4131476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 1/1/2011
TARGET COMP DATE: 1/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 11/5/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 12/21/2010 DATE COMPLETED: 01/15/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	4.00	0.00	01/15/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4131476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4131476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4131476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4155480** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 2/1/2011
TARGET COMP DATE: 2/28/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 12/3/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 01/24/2011 DATE COMPLETED: 02/03/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1KJJ	STATECH	2.00	0.00	02/03/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4155480** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4155480** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4155480** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4167957** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 3/1/2011
TARGET COMP DATE: 3/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 12/29/2010
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 02/22/2011 DATE COMPLETED: 03/13/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1RXL	STATECH	4.00	0.00	03/13/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4167957** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4167957** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4167957** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4200869** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 4/1/2011
TARGET COMP DATE: 4/30/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 2/11/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 03/21/2011 DATE COMPLETED: 04/27/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1KJJ	STATECH	4.00	0.00	04/27/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4200869** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4200869** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4200869** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4229333** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 5/1/2011
TARGET COMP DATE: 5/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 3/14/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 04/25/2011 DATE COMPLETED: 05/26/2011

		Labor Code/ Craft	Quantity	Planned Hours
EST. Labor HRS:	0.00			
ACT. Labor HRS:	3.00	OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1KJJ	STATECH	3.00	0.00	05/26/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR

20 CHECK GRATING

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4229333** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4229333** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4229333** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4253299** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: GREASING AND BRUSH IN CELLARS TAKEN CARE OF

TARGET START DATE: 6/1/2011
TARGET COMP DATE: 6/30/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 4/13/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 05/23/2011 DATE COMPLETED: 06/30/2011

EST. Labor HRS: 0.00
ACT. Labor HRS: 8.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP1KJJ	STATECH	8.00	0.00	06/30/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 CHECK CELLAR
20 CHECK GRATING
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4253299** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4253299** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4253299** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4268318** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: COMPLETED PRIOR BUT NOT RECORDED

TARGET START DATE: 7/1/2011
TARGET COMP DATE: 7/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 5/6/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/06/2013 DATE COMPLETED: 11/06/2013

EST. Labor HRS: 0.00
ACT. Labor HRS: 1.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CAWARNER	MGMT	1.00	0.00	11/06/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRATICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4268318** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4268318** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4268318** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4289721** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 8/1/2011
TARGET COMP DATE: 8/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 6/1/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 07/19/2011 DATE COMPLETED: 08/26/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	AESTRELLA	STATECH	4.00	0.00	08/26/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4289721** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4289721** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4289721** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4326030** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 9/1/2011
TARGET COMP DATE: 9/30/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 7/5/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 08/22/2011 DATE COMPLETED: 09/29/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	AESTRELLA	STATECH	4.00	0.00	09/29/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4326030** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4326030** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4326030** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4345104** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 10/1/2011
TARGET COMP DATE: 10/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 7/29/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 09/20/2011 DATE COMPLETED: 10/22/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	3.00	0.00	10/22/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4345104** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4345104** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4345104** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4360455** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 11/1/2011
TARGET COMP DATE: 11/30/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 8/29/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 10/17/2011 DATE COMPLETED: 11/19/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	3.00	0.00	11/19/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4360455** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4360455** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4360455** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4387356** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 12/1/2011
TARGET COMP DATE: 12/31/2011
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 10/7/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/21/2011 DATE COMPLETED: 12/17/2011

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.00	0.00	12/17/2011

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4387356** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4387356** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4387356** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4408476** PMNUM: **AC-OPSC2**
PARENT WO #:
DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 1/1/2012
TARGET COMP DATE: 1/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 11/4/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 12/13/2011 DATE COMPLETED: 01/14/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 5.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	5.00	0.00	01/14/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4408476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4408476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4408476** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4428965** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 2/1/2012
TARGET COMP DATE: 2/28/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 12/2/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 01/23/2012 DATE COMPLETED: 02/11/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.00	0.00	02/11/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4428965** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4428965** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4428965** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4461450** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 3/1/2012
TARGET COMP DATE: 3/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 12/30/2011
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 02/21/2012 DATE COMPLETED: 03/10/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.00	0.00	03/10/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4461450** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4461450** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4461450** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4471937** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS -

TARGET START DATE: 4/1/2012
TARGET COMP DATE: 4/30/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 1/24/2012
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 03/22/2012 DATE COMPLETED: 04/08/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.50

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.50	0.00	04/08/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4471937** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4471937** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4471937** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4508307** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 5/1/2012
TARGET COMP DATE: 5/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 2/24/2012
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 07/01/2012 DATE COMPLETED: 07/01/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 6.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	AOZUNA	STATECH	3.00	0.00	07/01/2012
	RBLACK	STATECH	3.00	0.00	07/01/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4508307** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4508307** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4508307** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **4531907** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 6/1/2012
TARGET COMP DATE: 6/30/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 4/4/2012
PM ACTIVITY CLASS: SURVEY

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 05/25/2012 DATE COMPLETED: 05/25/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	3.00	0.00	05/25/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **4531907** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **4531907** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **4531907** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5001313** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

TARGET START DATE: 7/1/2012
TARGET COMP DATE: 7/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CAN2
REQUESTED BY: BAGATES
REPORT DATE: 5/4/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 06/25/2012 DATE COMPLETED: 11/04/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 0.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5001313** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5001313** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5001313** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5001321** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 8/1/2012
TARGET COMP DATE: 8/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/4/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 08/26/2012 DATE COMPLETED: 08/26/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.50

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.50	0.00	08/26/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5001321** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5001321** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5001321** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010446** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 9/1/2012
TARGET COMP DATE: 9/30/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 09/23/2012 DATE COMPLETED: 09/23/2012

EST. Labor HRS: 0.00
ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.00	0.00	09/23/2012
	TP3JKR	STATECH	2.00	0.00	09/23/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010446** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010446** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010446** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010454** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 10/1/2012
TARGET COMP DATE: 10/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 10/21/2012 DATE COMPLETED: 10/21/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 6.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	2.00	0.00	10/21/2012
	AOZUNA	STATECH	2.00	0.00	10/21/2012
	TP3JKR	STATECH	2.00	0.00	10/21/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010454** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010454** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010454** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010462** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 11/1/2012
TARGET COMP DATE: 11/30/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/30/2012 DATE COMPLETED: 11/30/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	EWPINO	OPERATN	4.00	0.00	11/30/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010462** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010462** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010462** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010470** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 12/1/2012
TARGET COMP DATE: 12/31/2012
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 12/15/2012 DATE COMPLETED: 12/15/2012

EST. Labor HRS: 0.00

ACT. Labor HRS: 8.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	4.00	0.00	12/15/2012
	AOZUNA	STATECH	4.00	0.00	12/15/2012

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010470** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010470** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010470** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010478** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 1/1/2013
TARGET COMP DATE: 1/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 01/30/2013 DATE COMPLETED: 01/30/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RBLACK	STATECH	3.00	0.00	01/30/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010478** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010478** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010478** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010486** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 2/1/2013
TARGET COMP DATE: 2/28/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 02/18/2013 DATE COMPLETED: 02/18/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	4.00	0.00	02/18/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010486** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010486** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010486** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010494** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 3/1/2013
TARGET COMP DATE: 3/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 03/27/2013 DATE COMPLETED: 03/27/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RARAIZA	STATECH	3.00	0.00	03/27/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010494** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010494** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010494** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010502** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 4/1/2013
TARGET COMP DATE: 4/30/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 04/20/2013 DATE COMPLETED: 04/20/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	3.00	0.00	04/20/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010502** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010502** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010502** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5010510** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 5/1/2013
TARGET COMP DATE: 5/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/18/2012
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 05/27/2013 DATE COMPLETED: 05/27/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	2.00	0.00	05/27/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5010510** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5010510** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5010510** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5230820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 6/1/2013
TARGET COMP DATE: 6/30/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 3/21/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 06/25/2013 DATE COMPLETED: 06/25/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	AOZUNA	STATECH	2.00	0.00	06/25/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5230820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5230820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5230820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5264539** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 7/1/2013
TARGET COMP DATE: 7/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/4/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 07/27/2013 DATE COMPLETED: 07/27/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 6.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	3.00	0.00	07/27/2013
	AOZUNA	STATECH	3.00	0.00	07/27/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5264539** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5264539** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5264539** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5276660** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 8/1/2013
TARGET COMP DATE: 8/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: CLOSE
REQUESTED BY: BAGATES
REPORT DATE: 5/17/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 08/24/2013 DATE COMPLETED: 08/24/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RARAIZA	STATECH	2.00	0.00	08/24/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5276660** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5276660** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5276660** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5302585** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 9/1/2013
TARGET COMP DATE: 9/30/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 6/18/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 09/27/2013 DATE COMPLETED: 09/27/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	2.00	0.00	09/27/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5302585** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5302585** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5302585** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5326337** PMNUM: **AC-OPSC2**
PARENT WO #:
DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 10/1/2013
TARGET COMP DATE: 10/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 7/26/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 10/22/2013 DATE COMPLETED: 10/22/2013

EST. Labor HRS: 0.00
ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RSBARRA	OPERATN	3.00	0.00	10/22/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.
20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.
30 CHECK RAILINGS
40 CHECK PLATFORM
50 REMOVE WEEDS
60 CHECK FOR LEAKS
70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5326337** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5326337** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5326337** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5348629** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 11/1/2013
TARGET COMP DATE: 11/30/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 8/23/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/22/2013 DATE COMPLETED: 11/22/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	2.00	0.00	11/22/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5348629** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5348629** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5348629** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5370671** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 12/1/2013
TARGET COMP DATE: 12/31/2013
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 9/19/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 12/23/2013 DATE COMPLETED: 12/23/2013

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	2.00	0.00	12/23/2013

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS
JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5370671** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5370671** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5370671** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5393370** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 1/1/2014
TARGET COMP DATE: 1/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 10/18/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 01/20/2014 DATE COMPLETED: 01/20/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	01/20/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5393370** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5393370** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5393370** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5413488** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: MAXIMO #5494201

TARGET START DATE: 2/1/2014
TARGET COMP DATE: 2/28/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 11/15/2013
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 02/26/2014 DATE COMPLETED: 02/26/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.50

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RSBARRA	OPERATN	3.50	0.00	02/26/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5413488** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5413488** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5413488** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5461460** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 3/1/2014
TARGET COMP DATE: 3/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 1/6/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 03/27/2014 DATE COMPLETED: 03/27/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	3.00	0.00	03/27/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5461460** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5461460** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5461460** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5468834** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 4/1/2014
TARGET COMP DATE: 4/30/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 1/26/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 04/29/2014 DATE COMPLETED: 04/29/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	3.00	0.00	04/29/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5468834** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5468834** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5468834** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5489566** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 5/1/2014
TARGET COMP DATE: 5/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 2/19/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 05/21/2014 DATE COMPLETED: 05/21/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 6.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	JCOX	STATECH	3.00	0.00	05/21/2014
	RSBARRA	OPERATN	3.00	0.00	05/21/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5489566** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5489566** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5489566** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5511820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 6/1/2014
TARGET COMP DATE: 6/30/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 3/19/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 06/24/2014 DATE COMPLETED: 06/24/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP3JKR	STATECH	2.00	0.00	06/24/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5511820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5511820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5511820** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5536606** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 7/1/2014
TARGET COMP DATE: 7/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 4/17/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 07/22/2014 DATE COMPLETED: 07/22/2014

		Labor Code/ Craft	Quantity	Planned Hours
EST. Labor HRS:	0.00			
ACT. Labor HRS:	4.00	OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	07/22/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5536606** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5536606** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5536606** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5559037** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 8/1/2014
TARGET COMP DATE: 8/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 5/16/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 08/25/2014 DATE COMPLETED: 08/25/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	08/25/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5559037** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5559037** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5559037** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5589995** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 9/1/2014
TARGET COMP DATE: 9/30/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 6/25/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 09/25/2014 DATE COMPLETED: 09/25/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 3.50

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RSBARRA	OPERATN	3.50	0.00	09/25/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5589995** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5589995** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5589995** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5614603** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 10/1/2014
TARGET COMP DATE: 10/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 7/25/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 10/21/2014 DATE COMPLETED: 10/21/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	10/21/2014

JOB PLAN NUMBER: AC-OPS
JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5614603** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5614603** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5614603** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5642862** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 11/1/2014
TARGET COMP DATE: 11/30/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: BAGATES
REPORT DATE: 9/5/2014
PM ACTIVITY CLASS:

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM	3	832.020 C7

DATE STARTED: 11/24/2014 DATE COMPLETED: 11/24/2014

EST. Labor HRS: 0.00

ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
OPERATN	1	0.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	2.00	0.00	11/24/2014

JOB PLAN NUMBER: AC-OPS

JOB PLAN DESCRIPTION: MONTHLY WELL INSPECTIONS

JOB OPERATIONS:

10 WELL CELLARS SHALL BE COVERED AND KEPT DRAINED...
CELLARS SHOULD BE PROTECTED FROM AS MUCH RUNOFF WATER AS PRACTICAL.

20 GRATING OR FLOORING SHALL BE INSTALLED AND MAINTAINED IN...
GOOD CONDITION SO AS TO EXCLUDE PEOPLE AND ANIMALS.

30 CHECK RAILINGS

40 CHECK PLATFORM

50 REMOVE WEEDS

60 CHECK FOR LEAKS

70 MAKE SURE WELL HAS PROPER SIGNAGE

COMMENTS:

WORK ORDER #: **5642862** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

AC-OPS Operations 10-20 on the following equipment:

P-26

P-26A

P-26B

P-26C

P-26D

P-26E

P-25R

P-47

P-39

P-38

PS-42

P-40

SS-9

WORK ORDER #: **5642862** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-29

SS-25

SS-25A

22-25B

SS-1

SS-1-0

SS-6

SS-8

SS-5

SS-31

SS-44

SS-44A

WORK ORDER #: **5642862** PMNUM: **AC-OPSC2**

PARENT WO #:

DESCRIPTION: MONTHLY WELL INSPECTIONS - CREW TWO

SS-44B

SS-3

LOG:

WORK ORDER #: **5705182** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 12/1/2014
TARGET COMP DATE: 12/31/2014
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 12/15/2014
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 12/18/2014 DATE COMPLETED: 12/18/2014

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	12/18/2014

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5705182** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5705182** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5705182** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5705187** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 1/1/2015
TARGET COMP DATE: 1/31/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 1/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 01/28/2015 DATE COMPLETED: 01/28/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	01/28/2015

JOB PLAN NUMBER: AB1960-M-WELLS
JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5705187** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5705187** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5705187** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5727612** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 2/1/2015
TARGET COMP DATE: 2/28/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 2/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 02/16/2015 DATE COMPLETED: 02/16/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	JBANALES	STATECH	4.00	0.00	02/16/2015

JOB PLAN NUMBER: AB1960-M-WELLS
JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5727612** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5727612** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5727612** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5778516** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 4/1/2015
TARGET COMP DATE: 4/30/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 4/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 04/18/2015 DATE COMPLETED: 04/18/2015

EST. Labor HRS: 4.00 Labor Code/ Craft Quantity Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	JCOX	STATECH	4.00	0.00	04/18/2015

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5778516** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5778516** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5778516** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5799684** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 5/1/2015
TARGET COMP DATE: 5/31/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 5/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 05/17/2015 DATE COMPLETED: 05/17/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	MMCKENZI	STATECH	4.00	0.00	05/17/2015

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5799684** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5799684** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5799684** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5823636** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 6/1/2015
TARGET COMP DATE: 6/30/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 6/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 06/23/2015 DATE COMPLETED: 06/23/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 8.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	KJCAMPOS	STATECH	4.00	0.00	06/23/2015
	RSBARRA	OPERATN	4.00	0.00	06/23/2015

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

SED_RT_0469

WORK ORDER #: **5823636** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5823636** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5823636** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5847368** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: MAXIMOS ISSUED: #5907370,#5907371, #5907372

TARGET START DATE: 7/1/2015
TARGET COMP DATE: 7/31/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 7/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 07/29/2015 DATE COMPLETED: 07/29/2015

EST. Labor HRS: 4.00 Labor Code/ Craft Quantity Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	RVALDEZ3	STATECH	4.00	0.00	07/29/2015

JOB PLAN NUMBER: AB1960-M-WELLS
JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

SED_RT_0473

WORK ORDER #: **5847368** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5847368** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5847368** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5872025** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 8/1/2015
TARGET COMP DATE: 8/31/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 8/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 08/26/2015 DATE COMPLETED: 08/26/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	CMARTIN	STATECH	4.00	0.00	08/26/2015

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5872025** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5872025** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5872025** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5896506** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 9/1/2015
TARGET COMP DATE: 9/30/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 9/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 09/24/2015 DATE COMPLETED: 09/24/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	MMCKENZI	STATECH	4.00	0.00	09/24/2015

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5896506** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5896506** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5896506** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **5923229** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

REMARKS: INSPECTION COMPLETE, NO SUBSTANDARD CONDITIONS

TARGET START DATE: 10/1/2015
TARGET COMP DATE: 10/31/2015
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER:
STATUS: COMP
REQUESTED BY: MAXADMIN
REPORT DATE: 10/15/2015
PM ACTIVITY CLASS: ENVIRONMENTAL

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-WEST FIELD
LOC. DESCRIPTION: WEST FIELD
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
OPERTNS /	PM+	3	832.020 C7

DATE STARTED: 10/18/2015 DATE COMPLETED: 10/18/2015

EST. Labor HRS: 4.00

Labor Code/ Craft	Quantity	Planned Hours

ACT. Labor HRS: 4.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	MMCKENZI	STATECH	4.00	0.00	10/18/2015

JOB PLAN NUMBER: AB1960-M-WELLS

JOB PLAN DESCRIPTION: AB1960 MONTHLY PRODUCTION FACILITY/WELL INSPECTIONS

JOB OPERATIONS:

10 Inspect wells as follows:

a. Verify that appropriate signage is in place and legible. b. For well cellars with existing floor or grating, verify that floor or grating is in good condition so as to exclude people and animals, as applicable. c. Verify that well cellars are free of standing liquids. If liquid is present in any cellar, remove it using a vacuum truck or pump it to an appropriate location. d. Verify that roads leading to the wells are safe and passable. e. Check for signs of leakage or spills, corrosion and weeds/ debris.

20 Notify your supervisor immediately if any substandard conditions are found.

30 Create a follow-up work order for substandard conditions.

40 Reference California Code of Regulations, Title 14, Division 2, Section 1777(c)(1).

COMMENTS:

WORK ORDER #: **5923229** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18943
PORTER 26
PORTER 26
Lat: 34.315809376 **Long** -118.557236209

Asset: 18944
PORTER 26A
PORTER 26A
Lat: 34.315713631 **Long** -118.557349347

Asset: 18946
PORTER 26B
PORTER 26B
Lat: 34.315724662 **Long** -118.557307117

Asset: 19006
PORTER 26C (IDLE)
PORTER 26C
Lat: 34.315740508 **Long** -118.557258718

Asset: 18947
PORTER 26D
PORTER 26D
Lat: 34.315760302 **Long** -118.557172184

Asset: 18948
PORTER 26E
PORTER 26E
Lat: 34.315778247 **Long** -118.557109736

Asset: 18942
PORTER 25R
PORTER 25R
Lat: 34.316770589 **Long** -118.561246731

Asset: 18970
PORTER 47
PORTER 47
Lat: 34.31376686 **Long** -118.56016589

Asset: 18962
PORTER 39
PORTER 39
Lat: 34.312449281 **Long** -118.560033469

Asset: 18961
PORTER 38
PORTER 38
Lat: 34.312459627 **Long** -118.56107517

Asset: 18981
PORTER SESNON 42
PORTER SESNON 42
Lat: 34.311060976 **Long** -118.562464735

WORK ORDER #: **5923229** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 18963
PORTER 40
PORTER 40
Lat: 34.310028595 **Long** -118.561068394

Asset: 18991
STANDARD SESNON 9
STANDARD SESNON 9
Lat: 34.313533292 **Long** -118.5636765

Asset: 18999
STANDARD SESNON 29
STANDARD SESNON 29
Lat: 34.315286146 **Long** -118.56650612

Asset: 18996
STANDARD SESNON 25
STANDARD SESNON 25
Lat: 34.315091725 **Long** -118.564071354

Asset: 18997
STANDARD SESNON 25A
STANDARD SESNON 25A
Lat: 34.315067769 **Long** -118.564141408

Asset: 18998
STANDARD SESNON 25B
STANDARD SESNON 25B
Lat: 34.315013095 **Long** -118.564146337

Asset: 19008
STANDARD SESNON 1 (IDLE)
STANDARD SESNON 1
Lat: 34.318261511 **Long** -118.564493399

Asset: 19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0
Lat: 34.318304246 **Long** -118.564565996

Asset: 18988
STANDARD SESNON 6
STANDARD SESNON 6
Lat: 34.314090303 **Long** -118.570090299

Asset: 18990
STANDARD SESNON 8(IDLE)
STANDARD SESNON 8
Lat: 34.313254552 **Long** -118.568351168

Asset: 18987
STANDARD SESNON 5
STANDARD SESNON 5
Lat: 34.313829368 **Long** -118.566441739

WORK ORDER #: **5923229** PMNUM: **ACOPSC2**

PARENT WO #:

DESCRIPTION: AB1960 MONTHLY WELL INSPECTIONS CREW TWO

PERFORM JOB OPERATIONS ON THE FOLLOWING ASSETS:

Asset: 19000
STANDARD SESNON 31
STANDARD SESNON 31
Lat: 34.311017053 **Long** -118.564665987

Asset: 19010
STANDARD SESNON 44
STANDARD SESNON 44
Lat: 34.312487643 **Long** -118.565565909

Asset: 19001
STANDARD SESNON 44A
STANDARD SESNON 44A
Lat: 34.31245515 **Long** -118.565513163

Asset: 19002
STANDARD SESNON 44B
STANDARD SESNON 44B
Lat: 34.312438871 **Long** -118.565466876

Asset: 18983
STANDARD SESNON 3
STANDARD SESNON 3
Lat: 34.31228027 **Long** -118.563710533

LOG:

WORK ORDER #: **2793388** PMNUM: **8207**

PARENT WO #:

DESCRIPTION: F.I. SURVEY - GROUP 6 WELLS - ANNUAL

REMARKS: 6/23/06 Completed. No sign of sub-surface lks.

TARGET START DATE: 6/1/2006
TARGET COMP DATE: 8/29/2006
SCHEDULE START:
SCHEDULE FINISH:

ROUTE NUMBER: WELLS
STATUS: CLOSE
REQUESTED BY: MAXIMO
REPORT DATE: 7/15/2006
PM ACTIVITY CLASS: MISCELLANEOUS

ASSET #:
ASSET DESCRIPTION:
LOCATION ID: AC-GROUP 6 WELLS
LOC. DESCRIPTION: SS-4 SITE, 25 SITE, 29, 44 SITE, SS-1 SITE
PHYSICAL LOCATION:

RESPONSIBLE SUPERVISOR / OWNER	WORK TYPE	PRIORITY	ACCOUNT INFO
U.G. STORAGE /	PM+	3	2200-0299

DATE STARTED: 05/19/2006 DATE COMPLETED: 06/23/2006

EST. Labor HRS: 2.00
ACT. Labor HRS: 2.00

Labor Code/ Craft	Quantity	Planned Hours
STORAGE	1	2.00

ACTUALS POSTED:	LABORCODE	CRAFT	REG. HRS	OVERTIME	WORKDATE
	TP2ALT	STORAGE	2.00	0.00	06/23/2006

JOB PLAN NUMBER: AC-8017-A
JOB PLAN DESCRIPTION: WELL SURVEY - ANNUAL
JOB OPERATIONS:

5 SURVEY ID
10 INSPECT FI UNIT
15 ENDING DATE:
20 STARTING DATE:
25 SURVEYED BY:
30 REVIEW BY:
35 REASON:
40 METHOD:
45 DATE WORKED:
50 TIME STARTED:
55 TIME STOPPED:
60 LEAK INDICATIONS FOUND:
65 REMARKS:

WORK ORDER #: **2793388** PMNUM: **8207**

PARENT WO #:

DESCRIPTION: F.I. SURVEY - GROUP 6 WELLS - ANNUAL

COMMENTS:

WORK ORDER #: **2793388** PMNUM: **8207**

PARENT WO #:

DESCRIPTION: F.I. SURVEY - GROUP 6 WELLS - ANNUAL

AC-8017-A WELLS operations 5 - 65 on the following equip.:

18984
STANDARD SESNON 4
STANDARD SESNON 4

18985
STANDARD SESNON 4-0
STANDARD SESNON 4-0

18986
STANDARD SESNON 4A
STANDARD SESNON 4A

18996
STANDARD SESNON 25
STANDARD SESNON 25

18997
STANDARD SESNON 25A
STANDARD SESNON 25A

18998
STANDARD SESNON 25B
STANDARD SESNON 25B

18999
STANDARD SESNON 29
STANDARD SESNON 29

19001
STANDARD SESNON 44A
STANDARD SESNON 44A

19002
STANDARD SESNON 44B
STANDARD SESNON 44B

19008
STANDARD SESNON 1
STANDARD SESNON 1

WORK ORDER #: **2793388** PMNUM: **8207**

PARENT WO #:

DESCRIPTION: F.I. SURVEY - GROUP 6 WELLS - ANNUAL

19009
STANDARD SESNON 1-0
STANDARD SESNON 1-0

19010
STANDARD SESNON 44 SITE
STANDARD SESNON 44

20995
WELL SITE - ACW-SS4
STANDARD SESNON 4

21000
WELL SITE - ACW-SS4A
STANDARD SESNON 4A

21004
WELL SITE - ACW-SS4-0
STANDARD SESNON 4-0

21045
WELL SITE - ACW-SS25
STANDARD SESNON 25

21049
WELL SITE - ACW-SS25A
STANDARD SESNON 25A

21052
WELL SITE - ACW-SS25B
STANDARD SESNON 25B

21056
WELL SITE - ACW-SS29
STANDARD SESNON 29

21064
WELL SITE - ACW-SS44
STANDARD SESNON 44

21068
WELL SITE - ACW-SS44A

WORK ORDER #: **2793388** PMNUM: **8207**

PARENT WO #:

DESCRIPTION: F.I. SURVEY - GROUP 6 WELLS - ANNUAL

STANDARD SESNON 44A

21072
WELL SITE - ACW-SS44B
STANDARD SESNON 44B

21726
WELL SITE - ACW-SS-1
STANDARD SESNON 1

21730
WELL SITE - ACW-SS-1-0
STANDARD SESNON 1-0

LOG:

SOUTHERN CALIFORNIA GAS COMPANY
CPUC-SAFETY AND ENFORCEMENT DIVISION
DATA REQUEST DATED SEPTEMBER 28, 2018

SOCALGAS RESPONSE DATED NOVEMBER 2, 2018

SoCalGas provides the following Responses to the CPUC-Safety and Enforcement Division's (CPUC-SED) data request dated September 28, 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, 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.

As discussed during a meet and confer on October 16, 2018, SoCalGas is providing responses to Questions 1, 2, 4, 8, 9, 11, 12(a), 14, and 15. All other questions are postponed until SED has had an opportunity to review SoCalGas' narrative response to these questions. SED will then have an opportunity to respond to SoCalGas about additional information it may require.

Question 1:

Provide the following information that SoCalGas used between 1980 and October 2015 to identify exterior metal loss threats on its well down-hole production casings, down-hole surface casings, and well conductors (henceforth "well casings") at Aliso Canyon Storage Field (Aliso).

Response 1:

Between 1980 and October 2015, SoCalGas monitored and inspected active well production casings at its natural gas storage fields. SoCalGas monitored its production casings through the following methods listed below:

- Temperature Surveys: Temperature surveys monitor the mechanical integrity of a gas storage well and are used for leak detection. A temperature survey is a record of the temperature gradient in a well and is interpreted by looking for anomalies, or departures, from the reference gradient. A temperature instrument is lowered down a pressurized well on a weighted wire inside of the tubing to measure and record variations in temperature along the wellbore. Anomalies identified from the survey may result in the need for further investigation and may indicate a leak in the production casing (e.g., shoe leaks, stage collar leaks, etc.) or gas flow behind the production casing. A mechanical integrity issue due to exterior metal loss that results in a casing breach would manifest as an anomaly on a temperature survey. When a temperature survey is overlaid with a well schematic, the storage field engineer can identify whether there is pipe or a casing component at the depth of the anomaly. If there is no component present, this indicates a potential mechanical integrity issue which may be due to exterior metal loss. Conversely, if there is a stage collar at the depth of the anomaly, this indicates a potential stage collar leak. Temperature surveys are conducted in accordance with Division of Oil, Gas, and Geothermal Resources (DOGGR) regulations. As of October 23, 2015, DOGGR regulations required that temperature surveys be performed on an annual basis.

- Noise Surveys: Noise surveys monitor the mechanical integrity of a gas storage well and are used for leak detection. A sensitive microphone is lowered down a pressurized well inside of the tubing to listen and record for sound frequency changes. Since gas movement through a restriction generates sound, high noise amplitudes indicate locations of greater gas movement such as leaks. Anomalies identified from a noise survey may result in the need for further investigation and may indicate a leak in the production casing (e.g., shoe leaks, stage collar leaks, etc.) or gas flow behind the production casing. A mechanical integrity issue due to exterior metal loss that results in a casing breach would manifest as an anomaly on the noise survey. When a noise survey is overlaid with a well schematic, the storage field engineer can identify whether there is pipe or a casing component at the depth of the anomaly. If there is no component present, this indicates a potential mechanical integrity issue which may be due to exterior metal loss. Conversely, if there is a stage collar at the depth of the anomaly, this indicates a potential stage collar leak.

- Weekly Pressures: Weekly pressure readings are used to monitor the mechanical integrity of a gas storage well and are used for leak detection. Pressures are measured and recorded weekly on each well using a calibrated pressure gauge. Typically, a shallow production casing leak manifests as an anomalous surface casing pressure reading. Anomalous pressures in the surface casing result in the need for further investigation and may indicate a leak in the production casing due to exterior metal loss. Diagnostic steps such as temperature and/or noise logs and gas sampling can be used to determine the source of the pressure anomaly. As of October 23, 2015, DOGGR required weekly pressure readings of the tubing, casing, and surface casing.

- Pressure Testing: Pressure tests are used to test the mechanical integrity of a gas storage well during a workover when there is a rig on the well. The well is depressurized and filled with workover fluid to allow a crew to safely install equipment that gives pressure control of the well during a workover. The interior tubing and packer are pulled from the well, and a temporary tubing (work string) and a bridge plug/packer combination is set at various stations to conduct block tests of the production casing. The well is pressure tested at or above the maximum allowable operating pressure (MAOP) to ensure the casing has mechanical integrity. A mechanical integrity issue due to exterior metal loss that results in a casing breach would cause the pressure test to fail.

- Inventory Verification: Inventory verifications are used as a way to monitor the mechanical integrity of all the gas storage wells and are used for leak detection. The validity of the reported inventory for each storage field is evaluated and the operator verifies that the reported inventory is within the range that would be expected from reservoir analysis. Corrective action is taken if necessary.

- Daily Well Site Inspections: Observations of the equipment and conditions for each active well at the facility are conducted daily to check for signs of gas or liquid leaks. The operator uses visual, audible, and olfactory methods to detect leaks or abnormal conditions.
- Monthly Well Site Inspection: This inspection includes the inspections performed under the "Daily Well Site Inspections." In addition, the cellar floor, structural components, access roads, and general condition of the well site are inspected.
- Annual Surface Area Inspections: Surface area leak inspections of wells using gas detection equipment are conducted annually.

In addition to the monitoring described above, at various times prior to October 23, 2015, SoCalGas also performed the following types of casing inspections during a workover when there was a rig on a well.

- Caliper Log (Multi-Arm): This tool measures the inside diameter of the casing, while searching for changes in the wall integrity issues related to interior casing features.
- Cast/Cast-V Log (Ultrasonic): Circumferential acoustic scanning tool where ultrasonic pipe inspection (thickness and diameter) and cement evaluation are obtained simultaneously.
- Cement Bond Logs (Acoustic): This inspection log uses sound waves to verify bond or adhesion between casing and cement.
- Electromagnetic Thickness Log (Magnetic Flux Leakage): A measurement of the thickness of casing, giving an estimate of metal loss and detecting corrosion.
- High Resolution Vertilog (Magnetic Flux Leakage): The log uses magnetic flux measurements to identify and quantify internal and external corrosion defects. The multiaxial sensors (flux-leakage and discriminator sensors) provide circumferential inspection of the casing.
- MicroVertilog (Magnetic Flux Leakage): This tool creates a magnetic field to measure for any pitting in the steel casing and thickness of the steel.
- Pipe Analysis Log (Magnetic Flux Leakage): Measures magnetic flux leakage anomalies on the casing wall.
- Ultrasonic Imaging Tool (Ultrasonic): This tool uses ultrasonic sound waves to circumferentially measure internal radius and thickness of the casing as well as cement quality.
- Vertilog (Magnetic Flux Leakage): Measures magnetic flux leakage anomalies on the casing wall.

Please note, these casing inspection tools are not run on the surface casings and/or conductor casings of active wells. This is due to the physical presence of the production casing and no access to the surface and conductor casings. Surface casings can be inspected when a well is in the process of being plugged and abandoned. In addition, while SoCalGas utilized various casing inspection tools available between 1980-2015, these tools became more advanced and effective over time.

Question 2:

List the methods used to identify the threats asked about in question 1.

Response 2:

Please see Response 1.

Question 4:

List the methods used to analyze the threats asked about in question 1.

Response 4:

Please see Response 1.

Question 8:

What types of data are important for SoCalGas to identify:

a. That exterior metal loss is occurring on its well casings?
b. That exterior metal loss is a threat to its well casings?

Response 8:

SoCalGas interprets this request as relating to the time period between 1980-October 2015. Please see Response 1.

Question 9:

Between 1980 and October 2015, please provide which types of data, asked about in question 8, SoCalGas used at Aliso to:

a. Identify exterior metal loss threats to well casings
b. Identify and measure active exterior metal loss occurring in well casings

Response 9:

Please see Response 1.

Question 11:

Between 1980 and October 2015, has SoCalGas analyzed exterior metal loss on its well casings at Aliso?

Response 11:

Yes.

Question 12(a):

If SoCalGas has analyzed exterior metal loss on its well casings at Aliso between 1980 and October 2015:

a. Explain how.

Response 12(a):

Please see Response 1.

Question 14:

If SoCalGas has not analyzed exterior metal loss on its well casings at Aliso between 1980 and October 2015, please explain why not.

Response 14:

SoCalGas monitored and inspected active gas storage well production casings through the methods listed in Response 1. For surface and conductor casings, exterior metal loss has not been analyzed due to the presence of the production casing and lack of access to the surface and conductor casings. The surface casing can be inspected when a well is in the process of being plugged and abandoned.

Question 15:

If SoCalGas has not analyzed exterior metal loss on its well casings at Aliso between 1980 and October 2015, please provide the data SoCalGas used to justify this course of action.

Response 15:

See Response 14.

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'.)

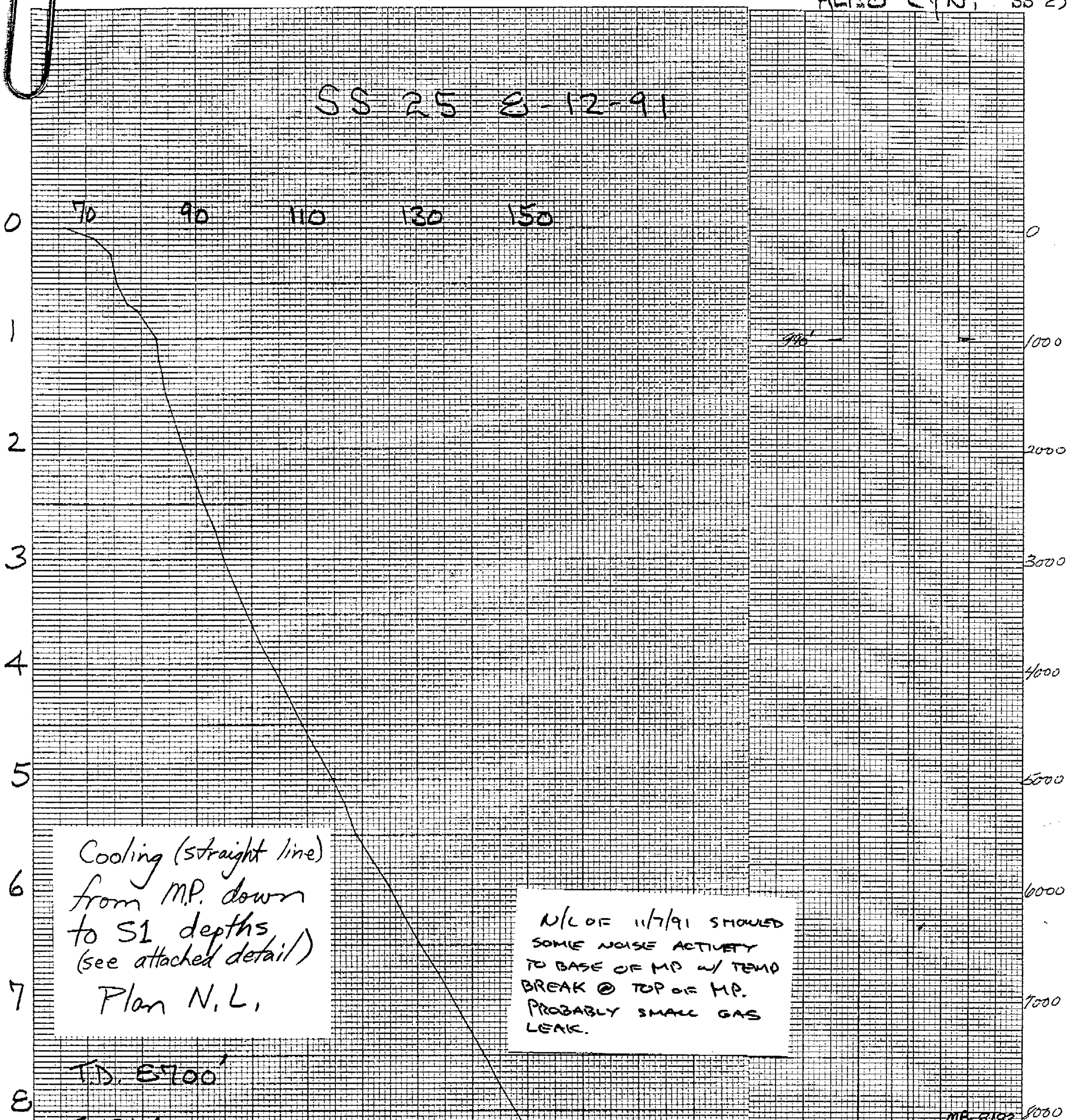
COMPANY	SOUTHERN CALIFORNIA GAS
WELL NO.	STANDARD SESNON No. 25
FIELD	ALISO CANYON
COUNTY	LOS ANGELES STATE CA
DATE	4-11-84

FLO-LOG INC.

NOISE AND TEMPERATURE SURVEY

PURPOSE OF SURVEY
CHECK FOR SHOE LEAK.

ALISO CYN, SS 25



5-8-85

46 1512

10 X 10 TO THE CENTIMETER 18 X 25 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

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

WELLBORE DATA

CASING AND TUBING RECORD

SIZE	WEIGHT	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

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.

LOGGING UNIT 712 LINE SIZE 3/16" LINE LENGTH 24,600 NOISE TOOL NO. 7107

DIAGRAM OF TOOLS USED:
DIAMETER OF TOOLS 1-3/8"
3-60" BARS, COLLAR LOCATOR, TEMPERATURE, NOISE

WELACO

PRODUCTION LOGGING

AUDIO DETECTION SURVEY

FILING NO.	COMPANY:	SOUTHERN CALIFORNIA GAS CO		
	WELL:	STANDARD SESNON 25		
	FIELD:	ALISO CANYON		
	COUNTY:	LOS ANGELES	STATE:	CALIFORNIA
	LOCATION:		OTHER SVC:	
JJ	API NUMBER: 040370776			
	SEC: 28	TWN: 3N	RNG: 16W	

PERMANENT DATUM: GROUND LEVEL ELEV:
LOG MEASURED FROM DF 6' PERM DATUM
DRILLING MEASURED FROM

-ELEVATIONS-
KB: Ft.
DF: Ft.
GL: Ft.

DATE LOG RAN	11-07-2006	PRESSURE	FLOWING	INJECTION	SHUT-IN
RUN NUMBER	ONE	TUBING PSI			2808
EFFECTIVE DEPTH	8748'	CASING PSI			2808
PICKUP DEPTH	8472'	INJECTION RATE			
BOT LOGGED INT	8472'	OBSERVED RATE			
TOP LOGGED INT	100'	R/A SOURCE			
TYPE OF INJECT	NONE	ACTIVITY			
FLUID IN WELL	GAS	HALF LIFE			
FLUID LEVEL	N/A				
WELL STATUS	STATIC		PRODUCTION DATA		
MAX TEMPERATURE	144.9 F	OIL Gr.		OIL =	
AT DEPTH	8107.0'	GAS Gr.		GAS=	
TEMPERATURE SENS	1 F/DIV.	MPP		BHP =	
LOGGING SPEED	VARIOUS			WATER=	
RECORDED BY	R. LOPEZ				
WITNESSED BY	N/A				
ENGINEER	N/A				
DEPTH CORRELATION	PACKER				

Equipment Data

Collar Locator	1.375"		
Temperature Tool	1.375"		
Audio Detector	1.375"		

Remarks/Survey Results

TOOL DIAGRAM

COLLAR LOCATOR AT 2'

TEMPERATURE TOOL AT 5'

AUDIO DETECTOR AT 8'

CASING AND TUBING RECORD

SIZE	WT(#)	FROM	TO	SIZE	WT(#)	FROM	TO
11.75"	42	SURFACE	990'				
7"	26	SURFACE	8585'				
5.5"	20	8559'	8748'				
2.875"	6.5	SURFACE	8496'				

STR.	PIPE DIA.	PERFORATIONS
A	7"	8475'-8476', 8510'-8538', 8542'-8585'.
	5.5"	8592'-8478'.
		PACKERS: 8486'-8502'.
		NO-GO: 8472'.

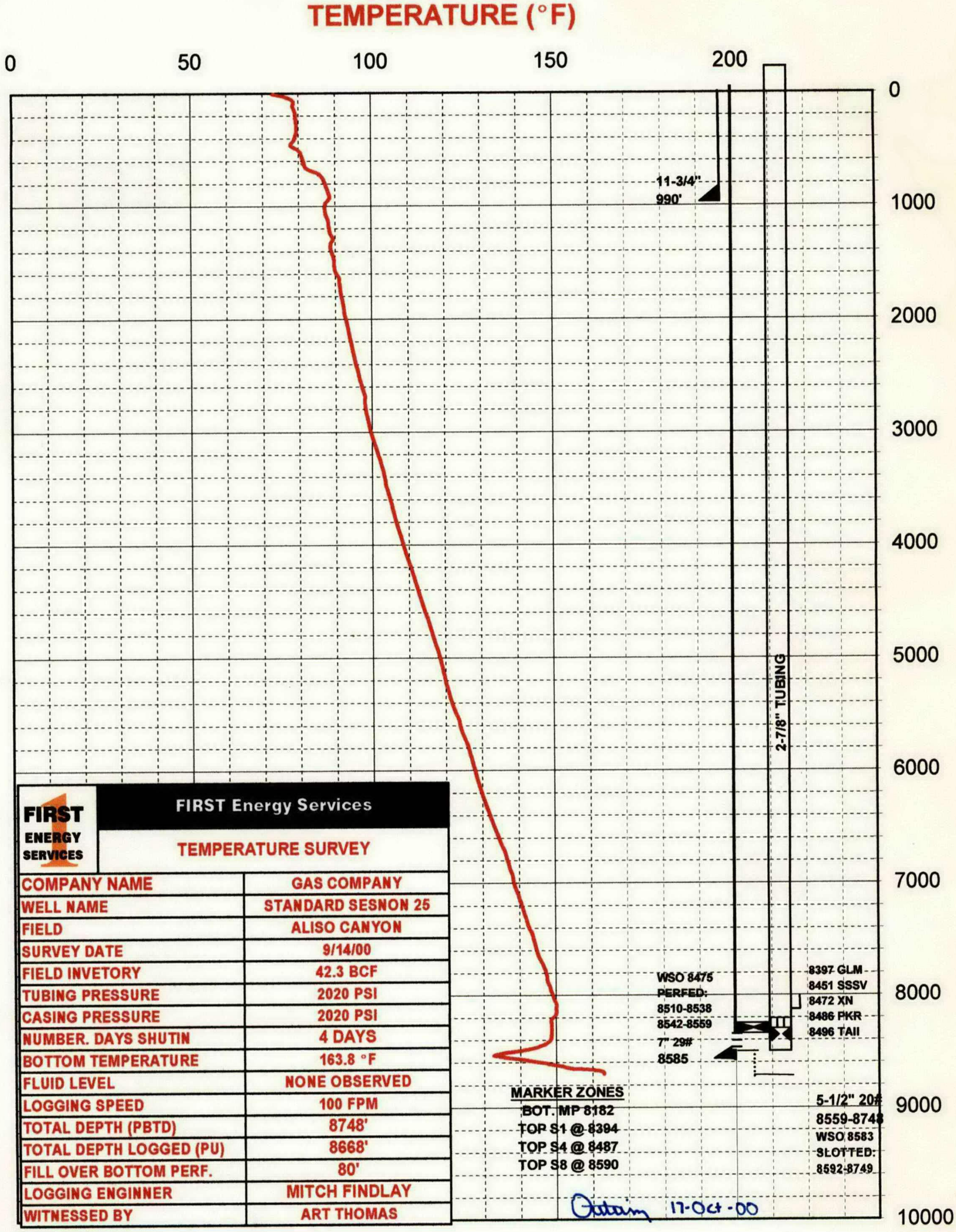
Audio Data: c:\data\Noise.txt

DEPTH	200HZ	600HZ	1000HZ	2000HZ
500	19.80	17.60	16.40	14.20
1000	19.50	16.00	14.80	13.00
1500	20.80	18.50	17.30	15.60
2000	21.40	18.80	17.70	16.00
2500	18.10	16.40	14.60	13.50
3000	18.80	16.30	15.30	14.00
3500	20.60	19.10	18.20	16.40
4000	16.80	15.30	14.10	12.50
4500	19.20	18.00	17.70	16.30
5000	17.70	16.20	15.40	13.90
5500	19.80	18.60	17.30	15.80
6000	17.70	17.10	16.30	14.80
6500	16.20	14.90	13.80	12.10
7000	18.40	16.80	16.00	14.40
7500	19.20	19.10	18.00	15.80
8000	17.00	16.40	15.30	13.80
8400	15.30	14.60	13.40	12.00
8425	16.70	16.10	15.10	13.50
8450	15.90	15.20	13.80	12.00
8472	15.70	15.00	14.10	12.40

1125 CCL 2125

75 TEMPERATURE 95

0.02 AUDIO DETECTION LOG (MV) 200



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

WELACO
PRODUCTION LOGGING

AUDIO DETECTION SURVEY

FILING NO.	
COMPANY:	SOUTHERN CALIFORNIA GAS CO
WELL:	STANDARD SESNON 25
FIELD:	ALISO CANYON
COUNTY:	LOS ANGELES
STATE:	CALIFORNIA
LOCATION:	
OTHER SVC:	
API NUMBER:	0403700776
SEC: 28	TWN: 3N RNG: 16W

JJ

PERMANENT DATUM: GROUND LEVEL ELEV:

LOG MEASURED FROM DF 6' PERM DATUM

DRILLING MEASURED FROM

-ELEVATIONS-
KB: Ft.
DF: Ft.
GL: Ft.

DATE LOG RAN	11-07-2006	PRESSURE	FLOWING	INJECTION	SHUT-IN
RUN NUMBER	ONE	TUBING PSI			2808
EFFECTIVE DEPTH	8748'	CASING PSI			2808
PICKUP DEPTH	8472'	INJECTION RATE			
BOT LOGGED INT	8472'	OBSERVED RATE			
TOP LOGGED INT	100'	R/A SOURCE			
TYPE OF INJECT	NONE	ACTIVITY			
FLUID IN WELL	GAS	HALF LIFE			
FLUID LEVEL	N/A				
WELL STATUS	STATIC		PRODUCTION DATA		
MAX TEMPERATURE	144.9 F	OIL Gr.		OIL =	
AT DEPTH	8107.0'	GAS Gr.		GAS=	
TEMPERATURE SENS	1 F/DIV.	MPP		BHP =	
LOGGING SPEED	VARIOUS			WATER=	
RECORDED BY	R. LOPEZ				
WITNESSED BY	N/A				
ENGINEER	N/A				
DEPTH CORRELATION	PACKER				

Equipment Data

Collar Locator	1.375"		
Temperature Tool	1.375"		
Audio Detector	1.375"		

Remarks/Survey Results

CASING AND TUBING RECORD

SIZE	WT(#)	FROM	TO	SIZE	WT(#)	FROM	TO
11.75"	42	SURFACE	990'				
7"	26	SURFACE	8585'				
5.5"	20	8559'	8748'				
2.875"	6.5	SURFACE	8496'				

STR.	PIPE DIA.	PERFORATIONS
A	7"	8475'-8476', 8510'-8538', 8542'-8585'.
	5.5"	8592'-8478'.
		PACKERS: 8486'-8502'.
		NO-GO: 8472'.

TOOL DIAGRAM

COLLAR LOCATOR AT 2'

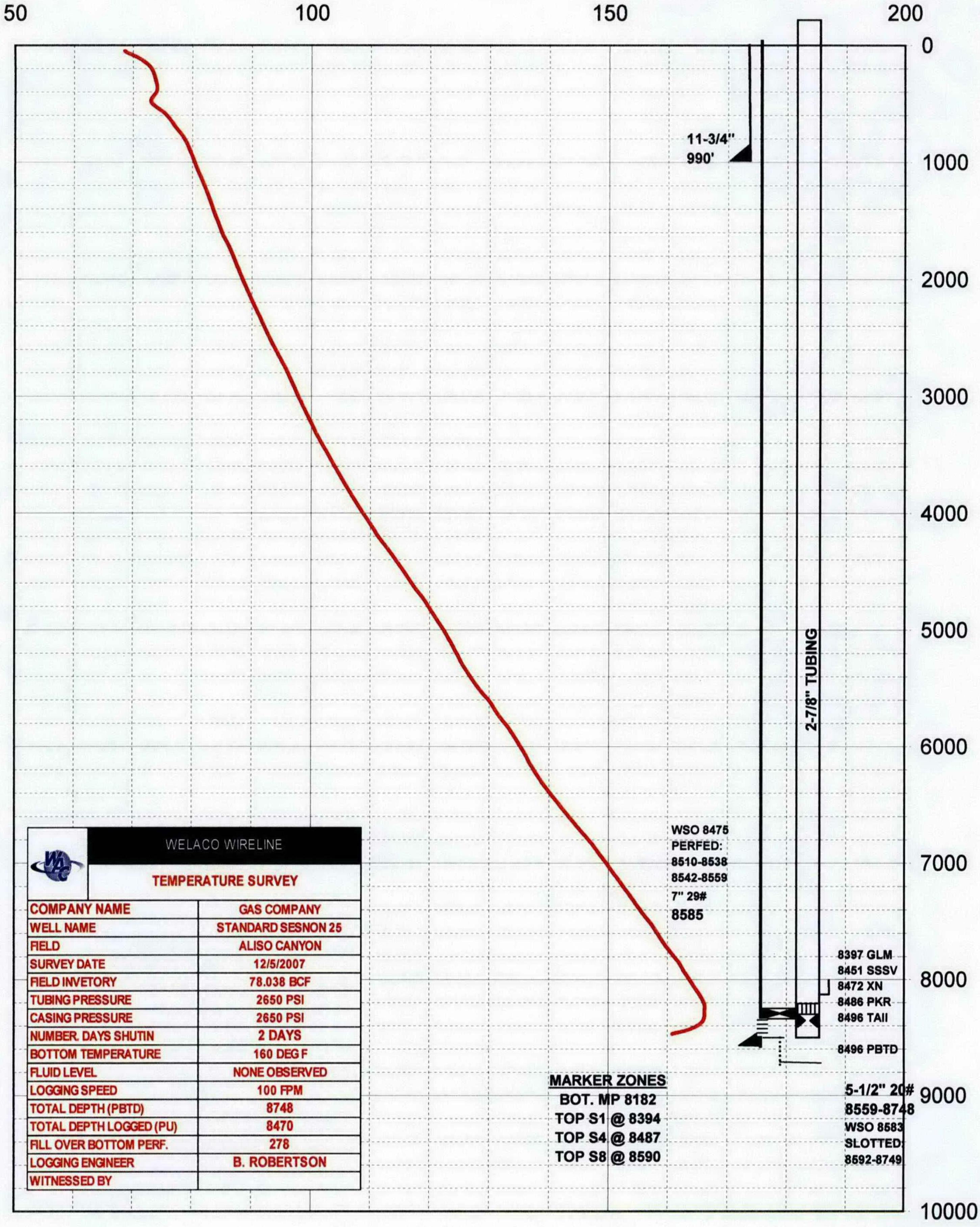
TEMPERATURE TOOL AT 5'

AUDIO DETECTOR AT 8'

Audio Data: c:\data\Noise.txt

DEPTH	200HZ	600HZ	1000HZ	2000HZ
500	19.80	17.60	16.40	14.20
1000	19.50	16.00	14.80	13.00
1500	20.80	18.50	17.30	15.60
2000	21.40	18.80	17.70	16.00
2500	18.10	16.40	14.60	13.50
3000	18.80	16.30	15.30	14.00
3500	20.60	19.10	18.20	16.40
4000	16.80	15.30	14.10	12.50
4500	19.20	18.00	17.70	16.30
5000	17.70	16.20	15.40	13.90
5500	19.80	18.60	17.30	15.80
6000	17.70	17.10	16.30	14.80
6500	16.20	14.90	13.80	12.10
7000	18.40	16.80	16.00	14.40
7500	19.20	19.10	18.00	15.80
8000	17.00	16.40	15.30	13.80
8400	15.30	14.60	13.40	12.00
8425	16.70	16.10	15.10	13.50
8450	15.90	15.20	13.80	12.00
8472	15.70	15.00	14.10	12.40

037.00776_SURVEY_TEMPERATURE_2007.12.05



TEMPERATURE SURVEY

COMPANY NAME	GAS COMPANY
WELL NAME	STANDARD SESNON 25
FIELD	ALISO CANYON
SURVEY DATE	12/5/2007
FIELD INVETORY	78.038 BCF
TUBING PRESSURE	2650 PSI
CASING PRESSURE	2650 PSI
NUMBER. DAYS SHUTIN	2 DAYS
BOTTOM TEMPERATURE	160 DEG F
FLUID LEVEL	NONE OBSERVED
LOGGING SPEED	100 FPM
TOTAL DEPTH (PBTD)	8748
TOTAL DEPTH LOGGED (PU)	8470
FILL OVER BOTTOM PERF.	278
LOGGING ENGINEER	B. ROBERTSON
WITNESSED BY	

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. Ops discovered surface leaks
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
4	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.
5	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.
6	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	
7	Saturday, October 24, 2015	1:20 PM				Shut in tubing with 2700 psi on it	
8	Saturday, October 24, 2015	1:30 PM		50		Put the well on Tubing flow to frac tank for few minutues and bled tubing down to 50 psi	
9	Saturday, October 24, 2015	2:07 PM	290	50	140	Halliburton began pumping 8.6 lb lease water down 7 inch casing	Started pumping 8.6# lease water 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. Continued pumped. At 89 barrels gas broke through surface at location and surrounding location. Continued Monitoring
10	Saturday, October 24, 2015	2:30 PM	250		400	When we shut down after 89 barrels was pumped and gas came to surface and we shut down, 7 inch casing pressure increased to 400 psi	
11	Saturday, October 24, 2015						
12	Saturday, October 24, 2015	5:00 PM	306	177			
13	Saturday, October 24, 2015	5:23 PM	307	200			
14	Saturday, October 24, 2015	5:30 PM	309	210			
15	Saturday, October 24, 2015	5:40 PM	310	218			
16	Saturday, October 24, 2015	5:50 PM	311	226			
17	Saturday, October 24, 2015	6:00 PM	312	232			
18	Saturday, October 24, 2015	6:10 PM	314	239			
19	Saturday, October 24, 2015	6:30 PM	316	251			
20	Saturday, October 24, 2015	7:00 PM	318	262			
21	Saturday, October 24, 2015	7:30 PM	322	274			
22	Sunday, October 25, 2015	8:45 AM	377	616	450		
23	Sunday, October 25, 2015	3:00 PM	401	674	459		

SED_RT_0506

DIA-WELL ELECTRIC LINE SERVICES

THE DIA-LOG COMPANY

A BIG THREE INDUSTRY

P. O. BOX 4008, WHITTIER, CALIFORNIA 90607-4008 · TELEPHONE (213) 946-6346

SOUTHERN CALIFORNIA GAS COMPANY
Fernando Fee 34
Aliso Canyon Field
Los Angeles County
Log Number 66620
April 29, 1991

SUMMARY

The attached Dia-Log Casing Minimum I.D. Caliper log covers 1725 feet or 41 joints of 7.0 inch O. D. casing with a weight of 23.0 lbs. per foot and is logged from the depth of 2300 feet to 575 feet according to wireline measurements. Well site information states that the log was run because of suspected parted casing at 570 feet, and to check for restrictions.

The Casing Minimum I. D. Caliper tool which was calibrated to log within a measuring range from 7-1/4 inches to 5.0 inches was lowered to and commenced logging at 2300 feet per customers request. A Casing Tally was not available to aid in the interpretation of the log trace.

The log trace reveals two areas of severe damage. The interval from 574 feet to 590 feet appears to be bursted from the inside outward. The interval from 1475 feet to 1515 feet appears deformed out-of-round (kinked). Both intervals apparently do not involve a casing connection and probably are not parted.

Multiple logging passes confirm the above damage.

PWM/jd

FF-34A History FILE

SOUTHERN CALIFORNIA

INTEROFFICE gas COMPANY CORRESPONDENCE

TO P. D. Yu
M. E. Melton

FROM R. L. Adamczyk
R. L. Adamczyk

DATE August 20, 1991

SUBJECT FF-34A Casing Corrosion, Aliso Canyon

It is recommended that FF-34A be equipped with cathodic protection (CP). CP can prevent further external casing corrosion. Chuck Skelton, Cathodic Protection Staff Engineer, has estimated the cost of CP for FF-34A at approximately $25,000 to $30,000. Annual O & M expenses are estimated at $400.

A meeting was held to exchange information on July 25, 1991, at Aliso Canyon. Schlumberger casing inspection and casing potential logs run in FF-34A during its workover, casing corrosion, and cathodic protection were discussed.

The FF-34A casing inspection (electromagnetic thickness) log showed severe metal loss at 2104' ELM, and shallow (1000' to 3000' ELM) metal loss which averaged approximately 15%. The FF-34A casing potential (corrosion and protection evaluation) log showed several anodic intervals (opposite the 8-5/8" casing), which demonstrates a need for CP. The cost of CP is minor when compared to the cost ($400,000+) of a workover should leakage problems develop in the future.

If funds are available, the Division should equip FF-34A with CP as soon as is operationally feasible.

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' to 3000' ELM), casing metal loss in FF-35C, MA-1A and MA-5A, there is not enough evidence to substantiate a regional corrosion problem.

If you have any questions, please advise.

RLA:11

cc: R. M. Dowell
R. L. Patterson
W. T. Scott
R. C. Skelton
Well History File

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.

Question 1:

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.

<u>Question 2</u>:

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.

<u>Response 2</u>:

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.

<u>Question 7</u>:

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.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE

STATE OF CALIFORNIA

SUBPOENA TO PROVIDE DOCUMENTS Public Utilities Code Sections 314, 314.5, 581, 582, 584, 701, 702, and 1791.	)))))))))

EXAMINATION UNDER OATH OF BRET LANE

REPORTER'S TRANSCRIPT
San Francisco, California
January 24, 2018
Pages 1 - 160
Volume - 1

Reported by: Thomas C. Brenneman, CSR No. 9554
Carol A. Mendez, CSR No. 4330
Karly Powers, CSR No. 13991
Jason Stacey, CSR No. 14092

have been some modifications to equipment, I don't recall.

Q All right. And on the SoCalGas side under this project management team, list who was present there along with you and Todd Van de Putte, and now we know Tom Egbert.

Were there any others who were part of that process?

A The process being physically there on the kill attempt?

Q Yeah.

A I don't recall who from our side was there at the time.

One clarification, I'm not -- I don't recall specifically, but sometime in November, I mean, we had started the planning for the relief well. And that's when I moved Todd over to be responsible for the overall design of implementation of starting the relief well.

So Todd is moved to that element as well. And I believe somewhere in this time frame is when -- again, it may be three. It may be four -- when I say three and four, kill attempts three and four. Somewhere in this time frame, I have Rodger Schwecke come in as my Deputy Operations Chief that's helping me out.

Q Are you aware what he was doing in his role or title before you called him, Rodger Schwecke?

A On the leak itself, Rodger was our VP of our Major Markets Customer Group at the time. And, again, I don't recall if it was week one or two or three. He responded and was helping out the incident response, what I call down below, in the -- by the plant area for a short period of time.

It may have been a week, two weeks or three. And then that's when I had Rodger come up to help me and was assigned into the operation side. And I don't recall if Rodger was there for Kill Attempt 3, but it's somewhere 3, 4, or 5 is when Rodger comes in.

Q Thank you. Todd Van de Putte, as you stated prior, moved to relief well efforts. Did you replace him?

A I had a number of engineers that were, again, part of that structure from the reservoir standpoint. Todd was still on the kill attempts -- at that point in time I would bring him for advice as well with his expertise on looking over the plant.

But, again, I just wanted to point -- at some point, he transitioned from being on that side every day or part of that

COUNTY OF LOS ANGELES
Public Health
LOS ANGELES COUNTY HEALTH AGENCY

BARBARA FERRER, Ph.D., M.P.H., M.Ed.
Director

MUNTU DAVIS, M.D., M.P.H.
Health Officer

CYNTHIA A. HARDING, M.P.H.
Chief Deputy Director

ANGELO J. BELLOMO, MS, REHS, QEP
Deputy Director for Health Protection

3530 Wilshire Boulevard, 11th Floor, Suite 1110
Los Angeles, California 90010
TEL (213) 351-0397

www.publichealth.lacounty.gov

Via Email: Jlane@SempraUtilities.com

March 11, 2019

Brett Lane
Chief Executive Officer
Southern California Gas Company
555 West 5th Street
Los Angeles, California 90013

ALISO CANYON NATURAL GAS DISASTER FOLLOW-UP REQUEST FOR CRITICAL DATA ELEMENTS

The Los Angeles County Department of Public Health (Public Health) has been made aware, through a permit renewal process required by the South Coast Air Quality Management District, of treatment systems utilized by Southern California Gas Company (SoCalGas) to remove crude oil routinely from natural gas before it is served into the distribution system. We are disheartened by the fact that SoCalGas did not disclose this critical information regarding crude oil contained in its gas reservoir at the Aliso Canyon Storage Facility. Thus, the massive quantity of natural gas released from October 23, 2015 through February 12, 2016 contained crude oil, while SoCalGas repeatedly stated during the disaster that the contents of the release were limited only to typical components of stored natural gas.

During the Aliso Canyon Natural Gas Disaster, Public Health conservatively operated under a hypothesis that natural gas in this geological storage reservoir was likely to contain traces of crude oil due to a previous history of oil extraction from the reservoir. In November 2015, Public Health recommended a complete characterization of air quality using an expanded list of chemicals typically found in both crude oil and natural gas, but this testing was severely limited and delayed. At that time, SoCalGas knew that crude oil was contained in the natural gas but withheld this information from Public Health. SoCalGas had an obligation to inform Public Health about known crude oil in its stored natural gas, as this information would have critically impacted Public Health's assessments of human exposures during the Disaster.

Whereas SoCalGas knowingly released both crude oil and natural gas during the Disaster without disclosing critical information to Public Health; whereas the health of nearby residents may have been impacted by exposure to both crude oil and natural gas during the Disaster; and whereas Public Health requires critical information for the forthcoming Health Research Study, Public Health directs SoCalGas to provide the following:

a) All records of sampling data related to the composition of natural gas at Aliso Canyon, before, during, and after the Disaster.
b) All records of environmental sampling data collected below and above mesh grates, which were utilized to mitigate oily mists released from Well SS-25.
c) All records regarding exterior home cleaning information, including, but not limited to, home addresses, ranking results at each property, and residue density and sampling results.
d) Facility access for Public Health to collect samples from the storage facility for the forthcoming Health Research Study and to make such data available to the public.

Sincerely,

Angelo J. Bellomo, MS, REHS, QEP
Deputy Director for Health Protection

AJB/

cc: Edward Randolph, Energy Division Director, California Public Utilities Commission
Wayne Nastri, Executive Director, South Coast Air Quality Management District

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 18, 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:

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed that SoCalGas would respond to this request by Thursday, November 14, 2019. Please see SoCalGas' response dated November 14, 2019.

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.

SoCalGas interprets "reservoir records" to mean reservoir pressures, rates, and inventory. As of October 23, 2015, these records were located in Soft OSI PI.

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 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:

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed that SoCalGas would respond to this request by Thursday, November 14, 2019. Please see SoCalGas' response dated November 14, 2019.

QUESTION 4:

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

RESPONSE 4:

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed that SoCalGas would respond to this request by Thursday, November 14, 2019. Please see SoCalGas' response dated November 14, 2019.

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.

The amount of working gas in the Aliso Canyon storage facility was approximately 77.3 Bcf on October 23, 2015. SoCalGas operates its storage fields on a combined basis so when gas is scheduled into storage, it is not scheduled into a specific storage field; therefore, there is no way to identify who owns the gas stored at a specific field.

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, SoCalGas responds as follows.

On November 11, 2019, SoCalGas and SED held a meet-and-confer at which time SED agreed to limit the scope of this request to the wells identified in "the 1988 memo," SS25A and SS25B, and agreed that SoCalGas would have additional time to (a) ascertain how long it would take to identify responsive documents and (b) provide a response to SED. SoCalGas understands "the 1988 memo" to refer to the 1988 Interoffice Correspondence attached to Page B-1 of Blade Energy Partner's (Blade) SS-25 RCA Supplementary Report Vol 4. – Regional and Local Flow Analysis.
In accordance with this understanding, a further response will be provided in the future.

Please refer to the following well files which have been previously provided to CPUC-SED:

WELL FILE	BATES RANGE
Porter 34	AC_CPUC_0090974 – AC_CPUC_0092612
Porter 37	AC_CPUC_0093975 – AC_CPUC_0095652

Porter 44	AC_CPUC_0025029 – AC_CPUC_0026077
Porter 46	AC_CPUC_0103865 – AC_CPUC_0105893
Porter 47	AC_CPUC_0105894 – AC_CPUC_0107436
Standard Sesnon 6	AC_CPUC_0109733 – AC_CPUC_0111547
Standard Sesnon 7	AC_CPUC_0031433 – AC_CPUC_0032449
Standard Sesnon 8	AC_CPUC_0111548 – AC_CPUC_0113261
Standard Sesnon 9	AC_CPUC_0113262 – AC_CPUC_0115072
Standard Sesnon 10	AC_CPUC_0032450 – AC_CPUC_0033456 AC_CPUC_0044537 – AC_CPUC_0045232
Standard Sesnon 17	AC_CPUC_0115073 – AC_CPUC_0116614
Standard Sesnon 25	AC_CPUC_0000023 – AC_CPUC_0000759 AC_CPUC_0012388- AC_CPUC_0012389
Standard Sesnon 25A	AC_CPUC_0000001 – AC_CPUC_0000011 AC_CPUC_0000760 – AC_CPUC_0001198
Standard Sesnon 25B	AC_CPUC_0000012 – AC_CPUC_0000022 AC_CPUC_0001199 – AC_CPUC_0001587
Standard Sesnon 29	AC_CPUC_0116615 – AC_CPUC_0118690

Frew 2	AC_CPUC_0061080 – AC_CPUC_0064036
Frew 4	AC_CPUC_0064037 – AC_CPUC_0065430

The following well files have not previously been provided to CPUC-SED. SoCalGas *anticipates* providing these well files by November 22, 2019.

Standard Sesnon 2
Standard Sesnon 4
Standard Sesnon 11
Standard Sesnon 24
Frew 5

QUESTION 7:

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

RESPONSE 7:

On November 11, 2019, SoCalGas and SED held a meet-and-confer during which SED agreed that SoCalGas would respond to this request by Thursday, November 14, 2019. Please see SoCalGas' response dated November 14, 2019.

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:

On September 10, 1990 a downhole condition was discovered in the FF-34A injection/withdrawal well. Surface casing pressures in nearby wells FF-34B and MA-5A has increased to 580 psi and 760 psi, respectively. The FF-34A well was subsequently killed on September 11, 1990. SoCalGas staff initiated an investigation as to the source of the subsurface condition and ran the following initial surveys to provide detailed information about the location and cause of the leak:

- 9/12/90 - temperature/noise/spinner surveys were run to help pinpoint the location of the leak. A cooling anomaly and high noise levels were observed from 1440' to 2060'.
- 9/12/90 - tracer survey was run to verify the leak.
- 9/14/90 - TDT log to determine gas saturation outside of the casing. The log indicated high gas concentrations behind the 8 5/8" production casing over the interval 1470' – 1515'. It was hypothesized that this was the entry level for the leaking gas, which pressured up a shallow Pliocene sand causing the elevated casing pressures in the two offset wells.

In September and October 1990, immediately after the leak, SoCalGas conducted a numerical simulation study to model the flow of the gas and to simulate the gas migration updip from the FF-34A well. The study also helped to determine the volume of gas lost at the FF-34A during the leak. The modeling study confirmed that

approximately 123 MMcf of gas was lost to a shallow sequence of interbedded sandstones and shales over the interval 1500' to 2000'.
The well workover to repair the leak was conducted in May 1991:

- 5/8/91 - During well workover, found holes in casing from 2093' to 2098'.
- 5/10/91 - During well workover, Schlumberger CPET (cathodic protection evaluation tool) log was run from 4000' to surface.
- 5/11/91 - During well workover, Schlumberger Multi-Frequency Electromagnetic
- 5/21/91 – Casing patch set from 2080' to 2120'.

In August 1991, SoCalGas staff recommended that the FF-34A be equipped with cathodic protection. The previous casing inspection logs showed severe metal loss at 2104', and shallow (1000' to 3000') metal loss which averaged 15%. The CPET log showed several anodic intervals opposite the 8 5/8" casing. Cathodic protection was subsequently installed on FF-34A.

Please refer to the well file for FF-34A previously provided to SED in electronic documents with the following Bates ranges.

Date of Response	Bates Range
March 3, 2017	AC_CPUC_0021524 – AC_CPUC_0021523
April 11, 2017	AC_CPUC_0037629 – AC_CPUC_0039274
August 10, 2017	AC_CPUC_0132688 – AC_CPUC_0132872

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.

<u>RESPONSE 9:</u>

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.

Please see response to Question 8.