

Application No: A.13-12-013  
Exhibit No.: \_\_\_\_\_  
Witness: David Buczkowski

\_\_\_\_\_  
)  
Application of Southern California Gas Company )  
(U 904 G) and San Diego Gas & Electric Company )  
(U 902 G) For Authority To Recover North-South )  
Project Revenue Requirement In Customer Rates )  
And For Approval Of Related Cost Allocation And )  
Rate Design Proposals )  
\_\_\_\_\_ )

A.13-12-013  
(Filed December 20, 2013)

**UPDATED SUPPLEMENTAL DIRECT TESTIMONY OF**

**DAVID BUCZKOWSKI**

**SAN DIEGO GAS & ELECTRIC COMPANY**

**AND**

**SOUTHERN CALIFORNIA GAS COMPANY**

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA

**November 12, 2014**

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1 **UPDATED SUPPLEMENTAL DIRECT TESTIMONY OF DAVID BUCZKOWSKI**

2 **I. PURPOSE**

3 The purpose of my supplemental direct testimony on behalf of Southern California Gas  
4 Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) is to respond to ALJ  
5 Long's request for a more detailed description of the project and schedule in support of the  
6 North-South Project Application.

7  
8 **II. PROJECT DEVELOPMENT AND COST ESTIMATION**

9 Design and cost estimates for the North-South Project were developed by SoCalGas  
10 personnel in the Major Projects, Engineering, Environmental and Gas Transmission Planning  
11 departments, supplemented with work done by ~~consultants an outside contractor~~, all working  
12 under my direction. SoCalGas contracted with ~~consultants the outside contractor, The Research~~  
13 ~~Corporation (TRC)~~, for specific tasks to support SoCalGas personnel in developing the  
14 ~~updated overall~~ scope, schedule and cost estimates to design, permit and construct the  
15 components of the North-South Project. ~~TRC is a national~~ ~~These~~ engineering, consulting, and  
16 construction management ~~firms provide firm providing~~ integrated services to the energy,  
17 environmental and infrastructure markets. ~~They~~ ~~TRC~~ provided expertise in pipeline engineering  
18 and design, and compressor station engineering and design. For example, ~~URS updated~~ ~~TRC~~  
19 ~~developed~~ the compressor station horsepower and compressor requirements along with  
20 identifying turbine/compressor packages and costs that would meet the preliminary design  
21 requirements set forth by SoCalGas. In other instances, SoCalGas and SDG&E did the work  
22 internally and this information was provided to ~~consultants~~ ~~TRC~~. For example, SoCalGas  
23 provided the emissions control approach, ~~emissions equipment requirements~~ and emissions  
24 equipment ~~requirements cost estimates~~ for the Adelanto Compressor Station turbines.

1 The design and development work was ~~led a joint effort~~ by SoCalGas employees ~~and~~  
2 ~~TRC employees. TRC was tasked~~ with support from consultants. SoCalGas compiled~~compiling~~  
3 a detailed project report (Report) that includes the project development and design work done by  
4 ~~both~~ SoCalGas and supported by consultants~~TRC employees~~. A portion of this Report is  
5 Attachment A to this testimony, and I am sponsoring it as part of my testimony.

6 The Report includes the following topics: 1) project summary, 2) identification of project  
7 components, 3) key assumptions, 4) route descriptions, 5) engineering and design summaries, 6)  
8 environmental overview, and 7) cost estimates. In order to preserve the safety and integrity of  
9 our system, certain sensitive system information has been redacted from Attachment A. The  
10 Report also provides route maps, topographic maps, geological maps, land ownership maps,  
11 compressor station and pressure limiting station drawings, cultural resources summary, crossings  
12 list and an environmental map book. For security reasons, this information is also not included  
13 in Attachment A.

14 The proposed North-South Project consists of ~~two~~three major components: Adelanto to  
15 Moreno Pipeline ~~and~~, Adelanto Compressor Station, ~~Both, and Moreno to Whitewater Pipeline.~~  
16 ~~Each~~ of these project components are~~is~~ addressed below, and in Attachment A.

17 The original Report included as Attachment A to my supplemental testimony filed on  
18 March 28, 2014 was jointly developed by SoCalGas and TRC. The report contained very  
19 detailed descriptions of the project scope, cost details, drawings, maps, and other information  
20 that were used as the basis for the cost estimate included in my original direct testimony. We  
21 have made significant progress in engineering, design, and planning resulting in changes to this  
22 detailed information. The extent of the development and the creation of new and updated  
23 detailed maps and drawings warranted a complete updating of the Report in Attachment A to this  
24 updated supplemental testimony.

1 **III. ADELANTO TO MORENO PIPELINE**

2 The proposed Adelanto to Moreno pipeline would begin at the compressor station in  
3 Adelanto, California, in San Bernardino County, and would run south and parallel to an existing  
4 SoCalGas transmission line for approximately 13 miles primarily within a dedicated road right-  
5 of-way. This area is mostly undeveloped with light residential towards the south end of the  
6 section. Construction in this area would be in close proximity to a SoCalGas transmission  
7 pipeline, two Kinder Morgan refined fuel lines, and sewer and utility lines serving residential  
8 customers. The pipeline would cross State Route 18, the California Aqueduct and the Union  
9 Pacific Railroad. These ~~three~~ crossings would be accomplished by boring under the  
10 road/railroad/aqueduct/flood control channel without disturbing the structure above. This  
11 technique requires establishing a bore pit on one side of the structure and a receiving pit on the  
12 other side at depths that allow for pushing a pipe or drilling a pipe casing straight between the  
13 two pits under the structure.

14 The pipeline would next enter the San Bernardino National Forest and traverse south  
15 through the Cajon Pass through the San Bernardino Mountains down to the community of  
16 Devore. The Cajon Pass is a mountain pass between the San Bernardino Mountains and the San  
17 Gabriel Mountains in linking Victor Valley with the Greater San Bernardino area. The pipeline  
18 would parallel an existing SoCalGas transmission pipeline where feasible. This section is  
19 approximately ~~810.2~~ miles and would be in a designated Federal Energy Corridor with two  
20 existing SoCalGas transmission pipelines and Southern California Edison electric transmission  
21 power lines. The Cajon Pass is also a major transportation corridor with Interstate 15 and  
22 Burlington Northern and Santa Fe Railroad, and Southern Pacific Railroad. The pipeline would  
23 cross Interstate 15 at two locations, the above railroad tracks and State Route 138. There is one

1 large creek crossing at Cleghorn Creek. These~~These three~~ crossings would be made using  
2 conventional boring techniques described above.

3 Mountainous terrain, steep slopes and potential environmental constraints along with  
4 crossing Interstate 15, State Route 138 and three railroad crossings make this the most  
5 challenging section of the pipeline to construct and would require significant coordination with  
6 United States Forest Service, Caltrans, and other resource agencies.

7 Set forth below in Figure 1 is a map of the current proposed route for the Adelanto to  
8 Moreno Pipeline:



The pipeline would exit the San Bernardino National Forest at the community of Devore and ~~travels south 7 travel southeasterly 5.3~~ miles along highway US 66 rural roads before entering an urban setting. This segment of the pipeline crosses the Interstate (I)-15 freeway and the 215/15 interchange.

1 The pipeline would primarily be routed along existing streets and public right-of-ways  
2 through urban areas in the cities of San Bernardino, ~~Redlands, and~~ Loma Linda, and Colton for  
3 ~~2616.8~~ miles. In this portion of the pipeline route, there are two major highway crossings, State  
4 Route 210 and Interstate 10. The pipeline also crosses the Santa Ana River and several  
5 ~~improved five significant~~ flood control channels. A horizontal directional drill technique would  
6 be employed to cross under the Santa Ana River. The horizontal directional drill method  
7 employs a surface launch drilling rig that is used to install a pipe in an arc along a prescribed  
8 path, under the river in this case, with minimal surface impacts. The flood control channels  
9 would be crossed using conventional bore technique described above.

10 The pipeline would then leave the urban setting and follow paved and unpaved roads  
11 through a low density residential development before entering uninhabited mountainous terrain  
12 in the area south of the city of Loma Linda. Finally, the pipeline would travel through a sparsely  
13 developed area in Moreno Valley in Riverside County and terminate at SoCalGas' Moreno  
14 Valley Pressure Limiting Station. Along this final ~~914.7~~ mile portion of the pipeline, there is one  
15 major highway crossing, State Route 60, and no major river crossings or major flood control  
16 channels. ~~Steep slopes in this area and potential environmental constraints will likely dictate~~  
17 ~~final alignment.~~

18 Cost estimates were discussed in my updated initial direct testimony. These estimates are  
19 based on the route analysis, miles of pipeline, key construction parameters and limitations, land  
20 ownership, and environmental considerations. Material estimates are based on feet of pipe,

1 planned number of valves, expected number of pipe elbows (45° & 90°), pig launchers and  
2 receivers and other materials. SoCalGas specified 36" pipe diameter, 0.625" wall thickness, and  
3 API 5L X70 pipe grade.

4 Construction estimates are based on the number of feet by type of terrain that range from  
5 cross country/open space to highly congested paved city streets and costs to lay pipe in different  
6 terrain conditions.

7 Land costs are based on land use, easements, and temporary construction easements,  
8 access roads and lay down yards. Environmental costs are based on expected CEQA and NEPA  
9 compliance costs, survey requirements, and construction monitoring and mitigation costs for the  
10 pipeline. Detailed cost estimate schedules for Adelanto to Moreno pipeline are in the Report, at  
11 Attachment VIII-VH, pages 2 through 3316.

#### 13 **IV. ADELANTO COMPRESSOR STATION**

14 The Adelanto Compressor Station would be upgraded from the current single gas-turbine  
15 driven compressor installed in the 1970's to modern natural gas turbine driven compressors  
16 providing approximately 30,000 horse power of compression and capable of delivering 800  
17 million cubic feet per day (MMcfd) of natural gas at 850 psig pressure for transportation to the  
18 Moreno Valley Pressure Limiting Station. The design is based on an operating range varying  
19 from 10075 MMcfd to 800 MMcfd, with a minimum inlet suction pressure of 475 psig and a  
20 maximum 850 psig station discharge pressure as provided by the SoCalGas/SDG&E Gas  
21 Transmission Planning Department.

22 To achieve these design parameters, SoCalGas contracted URS to conduct a detailed  
23 compressor and gas turbine analysis to further evaluate and optimize compressor package  
24 configuration alternatives including requests for bids from GE, Solar, and Siemens. The unit

1 configurations and station horsepower were developed by URS. These configurations were  
2 developed to satisfy the operating conditions of the compressor station.

3 Two~~Three~~ Solar Mars 100 turbines with C453 three stage compressors and two Taurus  
4 60<sup>1</sup> with C404 three~~C51-ML five~~ stage compressors are proposed for the turbine/compression  
5 package that would provide one of the best solutions for meeting all compressor station flow  
6 requirements. Each Mars 100 turbine would provide approximately 10,900 horsepower at site  
7 conditions of 3000 ft. elevation and 110° F ambient temperature. Each Taurus 60 turbine would  
8 provide approximately 5,700 horsepower at site conditions of 3000 ft. elevation and 110° F  
9 ambient temperature. This configuration~~Each turbine compressor set~~ provides a maximum flow  
10 rate of 800~~275 MMcfd for a compressor station total of 825~~ MMcfd at 475 psig suction pressure  
11 and 850 psig discharge pressure. This configuration was used to develop engineering, air  
12 emissions and permitting requirements and equipment and construction cost estimates.

13 The SoCalGas property parcel where the existing compressor station resides has  
14 sufficient room to install new compressors, auxiliary equipment and a building south of the  
15 existing station, however, additional land acquisition is planned for ancillary facilities - see  
16 Figure 2 below. The existing station would remain in place and in use during construction.

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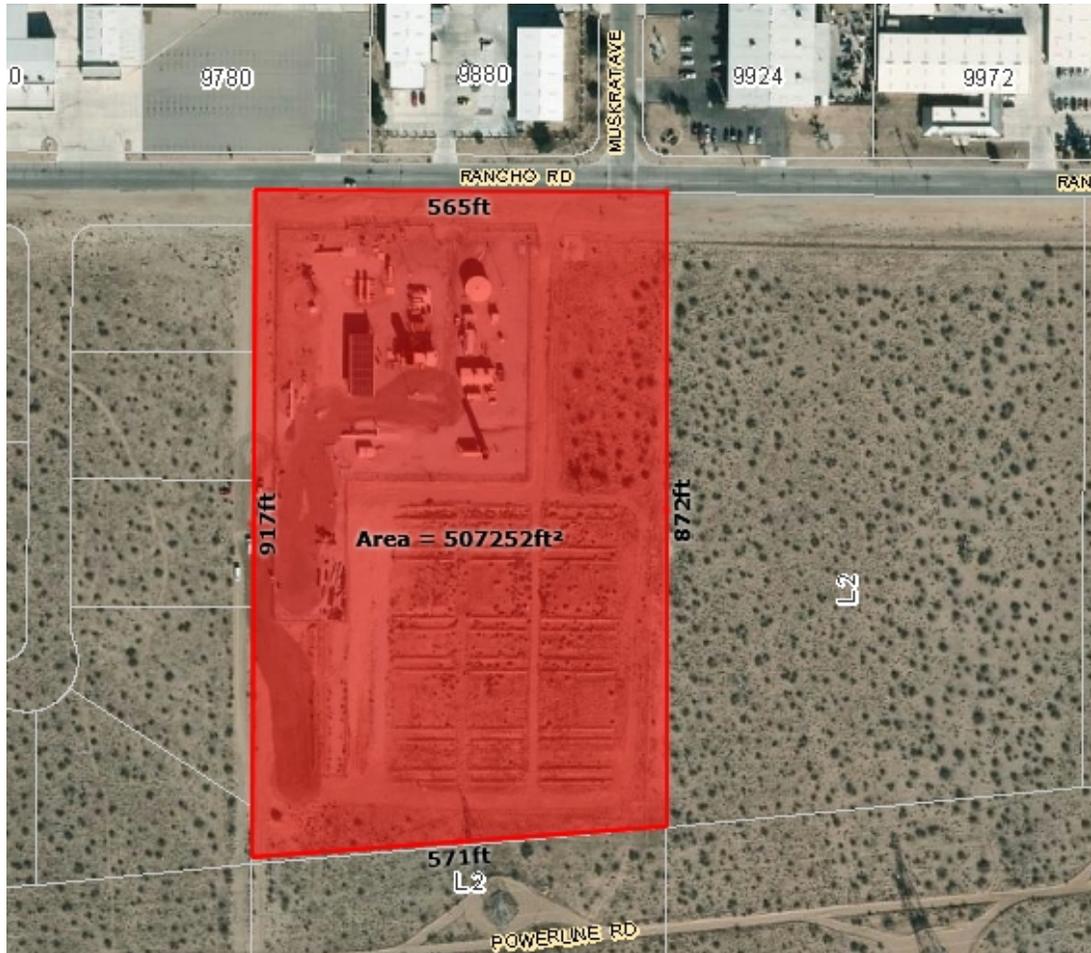
<sup>1</sup> Solar Taurus 70 turbines with five stage compressors are under investigation as an alternative to the Taurus 60 turbines and within the same cost range.

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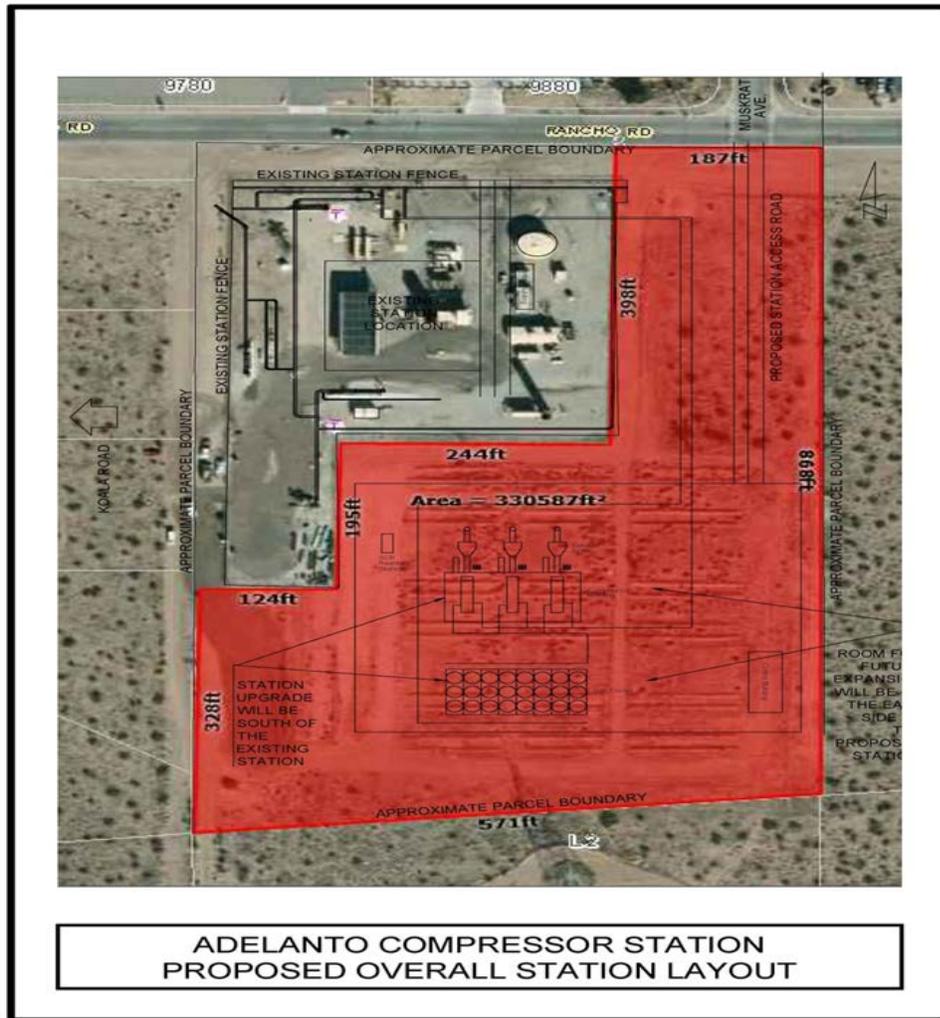
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**Figure 2**



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1           The Adelanto Compressor Station upgrades would include gas piping, on-site power  
 2 generation~~emergency generators~~, and above-ground vessels. The new gas cooling system would  
 3 be sized to match flow rates and anticipated compressor discharge gas temperature. The gas  
 4 cooling~~cooler~~ would be an-air coolers and~~cooled~~ heat exchanger~~exchanger~~.

5           The entire turbine/compressor package would be housed in an insulated pre-engineered  
 6 metal building that would provide weather protection and sound attenuation for both the turbines  
 7 and compressors. The compressor building would include a 10-ton overhead crane for moving  
 8 heavy components during station maintenance activities. A perimeter block wall would also be

1 constructed around the entire property providing both security and noise abatement. See  
2 Compressor Building Diagram in Report, at Attachment V.

3 An ~~Operations~~auxiliary building would be approximately 40-feet wide by 80-feet long by  
4 16-feet high and would house the ~~Operations~~Control Room including galley kitchen and  
5 restroom, electric room for motor control center, uninterruptible power supply and batteries,  
6 power transformer, and communications equipment. ~~A separate along with other equipment.~~  
7 ~~Part of the auxiliary~~ building ~~will house~~would be an equipment room housing air compressor  
8 equipment and a ~~generator.~~ Two additional buildings have been added for spare parts ~~and~~  
9 ~~workshop and fire suppression equipment. Finally a water tank has also been added. See~~  
10 ~~Stationroom. See Auxiliary Building Interior~~ Plan in Report, at Attachment V, Exhibit 5.

11 The Adelanto Compressor Station is in the Mojave Desert Air Basin and would be  
12 subject to Mojave Desert Air Quality Management District (~~MDAQMD~~) rules, regulations and  
13 permit requirements. As stated in my ~~updated~~initial direct testimony, the compressor station  
14 would be subject to Title V permit requirements as a federal major source.

15 Cost estimates were discussed in my ~~updated~~initial direct testimony. ~~Updated~~ Mars 100  
16 ~~and Taurus 60~~ Compressor ~~Packages~~Package costs are based on an estimate provided by the  
17 turbine manufacturer. SoCalGas and ~~URSTRC~~ developed valve, piping, and auxiliary  
18 equipment requirements and ~~URS~~ worked with vendors on developing equipment cost estimates.  
19 ~~URS prepared-Construction~~ cost estimates ~~are developed~~ using ~~several estimating tools including~~  
20 ~~Aspen Capital Cost Estimator (ACCE),<sup>2</sup> current published union labor rates, and URS added~~  
21 ~~allowances for scope items not included in the ACCE, crew hours by construction discipline and~~  
22 ~~construction equipment requirements by length of time on construction site.~~ SoCalGas

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<sup>2</sup> AspenTech - <http://www.aspentech.com/products/aspen-kbase.aspx>

1 developed emission ~~control and emission~~ credits cost estimates. Detailed cost estimate schedules  
2 are in the Report, at Attachment ~~VIII~~<sup>VII</sup>, pages ~~3523~~ through ~~46.31~~.

3 ~~V. MORENO TO WHITEWATER PIPELINE ROUTE DESCRIPTION~~

4 ~~The Moreno to Whitewater pipeline would run approximately 31.5 miles in Riverside~~  
5 ~~County east from Moreno Valley Pressure Limiting Station to Whitewater Pressure Limiting~~  
6 ~~Station in the San Gorgonio Pass between the Los Angeles Basin and Coachella Valley and Palm~~  
7 ~~Springs. The pipeline would parallel existing SoCalGas transmission pipelines as shown in~~  
8 ~~Figure 3. The pipeline starts out heading east in undeveloped terrain then enters mountainous~~  
9 ~~terrain. Steep slopes in this area and potential environmental constraints will dictate final~~  
10 ~~alignment.~~

11 ~~The pipeline continues east through undeveloped, flat desert land and into a narrow utility~~  
12 ~~corridor that extends through a developed residential area then back to undeveloped flat desert~~  
13 ~~lands.~~

14 ~~Figure 3~~



1 ~~and other materials. SoCalGas specified 36" pipe diameter, 0.625" wall thickness, and API 5L~~  
 2 ~~X70 pipe grade.~~

3 ~~Construction estimates are based on the number of feet by type of terrain that range from~~  
 4 ~~cross country/open space to paved city streets and costs to lay pipe in different terrain conditions.~~

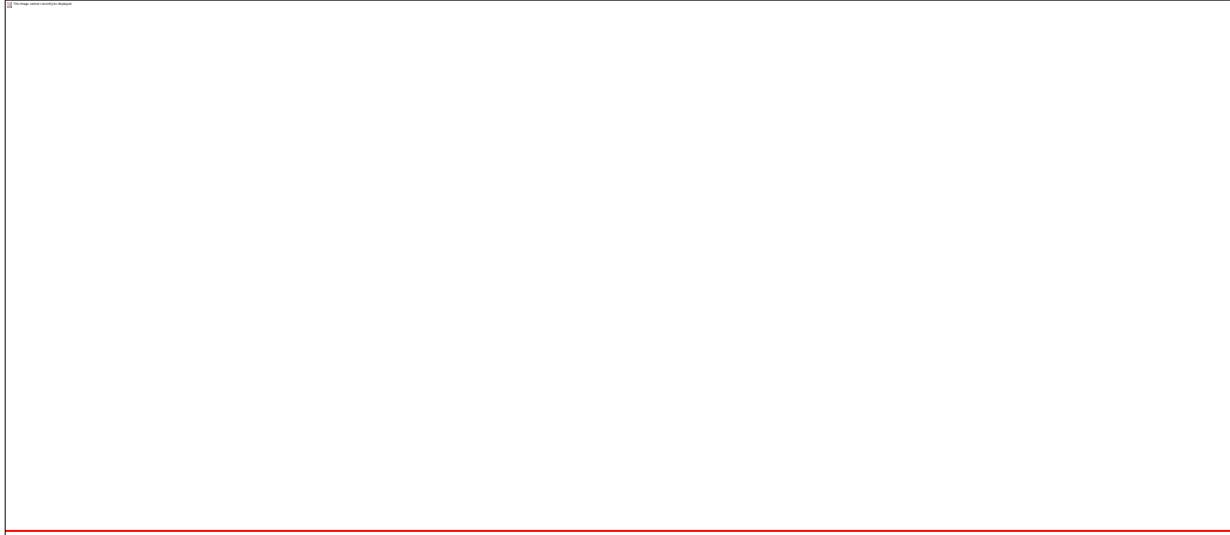
5 ~~Land costs are based on land ownership, easements, and construction easements, access~~  
 6 ~~roads and lay down yards. Environmental costs are based on expected CEQA compliance costs,~~  
 7 ~~survey requirements, and construction monitoring and mitigation costs for the pipeline. Detailed~~  
 8 ~~cost estimate schedules for Moreno to Adelanto pipeline are in the Report, at Attachment VII,~~  
 9 ~~pages 32 through 49.~~

10 **VI.V. PROJECT SCHEDULE**

11 Set forth below in Figure 34 is the ~~updated~~current project schedule that we have used in  
 12 developing our cost estimates.

13 **Figure 3**

Project Tasks	2014				2015				2016				2017				2018				2019				2020									
	Q1	Q2	Q3	Q4																														
Regulatory Proceeding	█																																	
Pipeline & PLS Engineering/Design	█																																	
Environmental Studies/Surveys	█																																	
Compressor Station Preliminary Engineering/Design	█																																	
CEQA Process	█																																	
NEPA Process	█																																	
Title V Permits																																		
Ministerial Permitting - Pipeline																																		
Ministerial Permitting - Compressor Station																																		
Pipeline & PLS Material Procurement																																		
Land & ROW Acquisition																																		
Compressor Station Engineering, Procurements, & Construction																																		
Pipeline & PLS Construction																																		
Project Reconciliation and Close-out																																		



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As stated in my updatedinitial direct testimony, SoCalGas and SDG&E estimate that it would take approximately six years to permit, engineer/design, procure, construct and place the new assets in service. Figure 34 illustrates at a high level the major activities that comprise the overall project schedule. Regulatory approval of the North-South Project application is assumed to occur by March of 2017, six months after CEQA and NEPA reviews have been completed.between February and December of 2015. The initial years of the project focus primarily on the preliminary engineering and design work, as well as the environmental surveys and data collection that are necessary to develop and support the environmental reviews and various permit applications. These activities include detailed reviews and mapping of the pipeline routes and finalization of the compression equipment types and expected emissions. These activities would run concurrent with the North-South Project application.

The environmental clearance process is anticipated to last two years. The assumption for the schedule depicted above, and as stated in my updatedinitial direct testimony, is that receipt of final environmental clearance would precede material procurement, land and right-of-way acquisition, and awarding of any major construction contracts.

1 Prior to any construction activity commencing at the compressor station, the Title V  
2 permit must be amended. The basis of this schedule is that the permit amendment is received  
3 one year after submitting the amendment application. Prior to the MDAQMD issuing an  
4 amended ~~Prior to submitting the~~ Title V ~~permit amendment application~~, SoCalGas would need to  
5 purchase the necessary emissions reduction credits.

6 Pipeline materials, equipment and significant land acquisitions would not begin until  
7 CEQA ~~and NEPA are~~ complete and the application is approved. Adelanto Compressor Station  
8 final engineering, equipment and materials procurement and construction would begin once  
9 CEQA ~~and NEPA are~~ complete, the application is approved and the Title V permit amendment  
10 is complete.

11 On October 17, 2013, SoCalGas received approval from its Board of Directors to pursue  
12 the North-South Project Application. SoCalGas also reviewed with its Board of Directors at the  
13 October 17, 2013 meeting the plan to spend approximately \$10MM to commence preliminary  
14 engineering, design, survey, and permitting activities relating to the proposed North-South  
15 Project. The Sempra Energy Board of Directors was also briefed on the application.

16 SoCalGas will need an additional review and approval – an “Authorization for  
17 Expenditure” or “AFE” -- from the Sempra Board of Directors and SoCalGas Board of Directors  
18 prior to commitment of expenditures for procurement and construction. Depending on the  
19 expenditure level, separate Board of Directors review and approvals will also be required for  
20 significant purchase orders and construction contracts related to the North-South Project. Such  
21 authorizations would be sought by utility management prior to the particular expenditures  
22 covered by the AFE.

23 This concludes my updated supplemental prepared direct testimony.