

Application of SOUTHERN CALIFORNIA GAS )  
COMPANY for authority to update its gas revenue )  
requirement and base rates )  
effective January 1, 2016 (U 904-G) )

Application No. 14-11-\_\_\_\_  
Exhibit No.: (SCG-07-CWP)

CAPITAL WORKPAPERS TO  
PREPARED DIRECT TESTIMONY  
OF RAYMOND K. STANFORD  
ON BEHALF OF SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA

NOVEMBER 2014





**2016 General Rate Case - APP  
INDEX OF WORKPAPERS**

**Exhibit SCG-07-CWP - GAS TRANSMISSION**

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**Overall Summary For Exhibit No. SCG-07-CWP**

<b>Area:</b>	<b>GAS TRANSMISSION</b>
<b>Witness:</b>	<b>Raymond K. Stanford</b>

	In 2013 \$ (000)		
	Adjusted-Forecast		
	2014	2015	2016
<b>B. New Pipelines (BC 3X1)</b>	17,845	17,845	17,845
<b>C. Replacements (BC 3X2)</b>	6,123	6,706	5,819
<b>D. Freeway Relocations (BC 3X3)</b>	450	450	450
<b>E. Relocations - Private/Franchise (BC 3X4)</b>	9,879	4,672	8,791
<b>F. Compressor Stations (BC 3X5)</b>	9,883	32,250	79,639
<b>G. Cathodic Protection (BC 316)</b>	1,332	8,986	8,986
<b>H. M&amp;R Stations (BC 3X8)</b>	7,991	9,423	9,321
<b>I. Auxiliary Equipment (BC 3X9)</b>	6,879	9,556	6,879
<b>J. Land Rights (BC 617)</b>	149	149	149
<b>K. Storage - Buildings (BC 632)</b>	24	1,589	24
<b>L. Transmission - Buildings (BC 633)</b>	480	8,679	11
<b>M. Laboratory Equipment (BC 730)</b>	485	485	485
<b>N. Capital Tools (BC 736)</b>	687	687	687
<b>O. Supervision &amp; Engineering Pool (BC 908)</b>	1,895	2,318	2,509
<b>Total</b>	<b>64,102</b>	<b>103,795</b>	<b>141,595</b>

*Note: Totals may include rounding differences.*

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Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: B. New Pipelines (BC 3X1)  
Workpaper: VARIOUS

**Summary for Category: B. New Pipelines (BC 3X1)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	911	911	911
Non-Labor	0	16,934	16,934	16,934
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>17,845</b>	<b>17,845</b>	<b>17,845</b>
FTE	0.0	8.4	8.4	8.4

**00301A EI Segundo Pipeline enhancement.**

Labor	0	306	459	0
Non-Labor	0	5,736	8,604	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>6,042</b>	<b>9,063</b>	<b>0</b>
FTE	0.0	2.8	4.2	0.0

**00301B North Coast System Reliability - R/W acquisition**

Labor	0	0	0	0
Non-Labor	0	0	5,000	5,000
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>5,000</b>	<b>5,000</b>
FTE	0.0	0.0	0.0	0.0

**00301D Line 2001 Looping - Chino to Moreno - R/W acquisition**

Labor	0	0	0	0
Non-Labor	0	0	2,000	2,000
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2,000</b>	<b>2,000</b>
FTE	0.0	0.0	0.0	0.0

**00301F Multiple smaller pipeline projects worked on Blanket W.O.s**

Labor	0	605	452	911
Non-Labor	0	11,198	1,330	9,934
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>11,803</b>	<b>1,782</b>	<b>10,845</b>
FTE	0.0	5.6	4.2	8.4

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00301A - El Segundo Pipeline enhancement.**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 1. El Segundo Pipeline enhancement.  
 Workpaper Group: 00301A - El Segundo Pipeline enhancement.

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	306	459	0
Non-Labor	Zero-Based	0	0	0	0	0	5,736	8,604	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,042</b>	<b>9,063</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	2.8	4.2	0.0

**Business Purpose:**

Add needed capacity and redundancy to the local Transmission piping system needed to serve two UEG plants, Chevron's El Segundo refinery, and new demand at the Hyperion Wastewater treatment facility.

**Physical Description:**

Install approximately 3.75 miles of new 20 inch pipe, valves and fittings connecting Line 1172 on the west to Line 1170 and Line 1175 on the east in the City of El Segundo thereby creating a transmission pipeline "loop" in the El Segundo area. This solution provides not only the necessary incremental capacity but a level of redundancy that is currently lacking, insuring more reliable service.

**Project Justification:**

Recent repowering at NRG's El Segundo Energy Center and at LADWP's Scattergood facility, along with growing demand at Chevron's El Segundo refinery and new demand at the Hyperion Wastewater treatment facility have taxed the capacity of the transmission lines serving the area: Lines 1172 and 1173. Additionally, both the NRG and LADWP facilities have new "quick-start" technology, which will result in sudden and dramatic increases in demand on our system. System improvement is necessary to sustain continued, uninterrupted, reliable gas service to the area.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00301.0  
Category: B. New Pipelines (BC 3X1)  
Category-Sub: 1. El Segundo Pipeline enhancement.  
Workpaper Group: 00301A - El Segundo Pipeline enhancement.

**Forecast Methodology:**

**Labor - Zero-Based**

Calculated as a percentage of total direct project costs. Project costs are based on recorded projects of similar scope, pipe size and environment.

**Non-Labor - Zero-Based**

Project costs are based on recorded projects of similar scope, environment, pipe size and workforce deployment.

**NSE - Zero-Based**

None. This is a pipeline construction project.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00301A**

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2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 1. El Segundo Pipeline enhancement.  
 Workpaper Group: 00301A - El Segundo Pipeline enhancement.  
 Workpaper Detail: 00301A.001 - El Segundo Pipeline enhancement.  
 In-Service Date: 09/30/2015  
 Description:

Gas Transmission - New Pipelines

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		306	459	0
Non-Labor		5,736	8,604	0
NSE		0	0	0
	<b>Total</b>	<b>6,042</b>	<b>9,063</b>	<b>0</b>
FTE		2.8	4.2	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00301B - North Coast System Reliability - R/W acquisition**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 2. North Coast System Reliability - R/W acquisition  
 Workpaper Group: 00301B - North Coast System Reliability - R/W acquisition

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	0	
Non-Labor	Zero-Based	0	0	0	0	0	5,000	5,000	
NSE	Zero-Based	0	0	0	0	0	0	0	
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,000</b>	<b>5,000</b>	
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Business Purpose:**

Provide needed improved reliability and redundancy to the gas transmission system north of Gaviota which is currently over-dependent of the PG&E system.

**Physical Description:**

Ultimately, this project is to install approximately 80 miles of 36 inch Transmission line from the Taft area in the southern San Joaquin valley area westerly to near Gaviota. This work paper sponsors only preliminary right-of-way and land acquisition to take place prior to actual piping construction.

**Project Justification:**

This project will provide improved reliability and redundancy to the North Coastal System north of Gaviota. The system is currently dependent on supply from PG&E during extreme design conditions, and entirely on PG&E in the event of an outage on Line 1010.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00301.0  
Category: B. New Pipelines (BC 3X1)  
Category-Sub: 2. North Coast System Reliability - R/W acquisition  
Workpaper Group: 00301B - North Coast System Reliability - R/W acquisition

**Forecast Methodology:**

**Labor - Zero-Based**

None. This work paper is for non-labor land rights purchases only.

**Non-Labor - Zero-Based**

Land rights purchases in recent years have averaged approximately \$267,000 per mile. This work paper sponsors approximately 18.7 miles of land rights purchases at \$267k per mile in 2015 and 2016.

**NSE - Zero-Based**

Land rights purchases should be booked with the expectation of non-standard escalation due to the fact they are not in themselves pipelines.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00301B**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 2. North Coast System Reliability - R/W acquisition  
 Workpaper Group: 00301B - North Coast System Reliability - R/W acquisition  
 Workpaper Detail: 00301B.001 - North Coast System Reliability - R/W acquisition  
 In-Service Date: 09/30/2015  
 Description:

Gas Transmissison - New Pipelines

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	0
Non-Labor		0	5,000	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>5,000</b>	<b>0</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 2. North Coast System Reliability - R/W acquisition  
 Workpaper Group: 00301B - North Coast System Reliability - R/W acquisition  
 Workpaper Detail: 00301B.002 - North Coast Sysstem Reliability - R/W acquisition  
 In-Service Date: 09/30/2016  
 Description:

Gas Transmission - New Pipelines

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	0
Non-Labor		0	0	5,000
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>5,000</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00301D - Line 2001 Looping - Chino to Moreno - R/W acquisition**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 3. Line 2001 Looping - Chino to Moreno - R/W acquisit  
 Workpaper Group: 00301D - Line 2001 Looping - Chino to Moreno - R/W acquisition

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	0	
Non-Labor	Zero-Based	0	0	0	0	0	2,000	2,000	
NSE	Zero-Based	0	0	0	0	0	0	0	
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,000</b>	<b>2,000</b>	
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Business Purpose:**

Reinforce supply and reduce pressure loss to the southerly coastal Transmission system and San Diego. Provides the final tie for looping Line 2001

**Physical Description:**

Approx. 30 miles of 36 inch Transmission line between the Chino crossover and Moreno Station.

**Project Justification:**

This installation will allow for reduced pressure loss when flowing supply from Chino to Moreno, or increased flow at the current pressure loss. The main objective is to increase supply to Moreno which is a principal source of supply to San Diego via Rainbow compressor station. This work paper supports initial land rights acquisition to be made in 2015 prior to pipeline construction.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00301.0  
Category: B. New Pipelines (BC 3X1)  
Category-Sub: 3. Line 2001 Looping - Chino to Moreno - R/W acquisit  
Workpaper Group: 00301D - Line 2001 Looping - Chino to Moreno - R/W acquisition

**Forecast Methodology:**

**Labor - Zero-Based**

None. This work paper is for non-labor land rights purchases only.

**Non-Labor - Zero-Based**

Land rights purchases in recent years have averaged approximately \$267,000 per mile. This work paper sponsors approximately 7.5 miles of land rights purchases at \$267k per mile in 2015 and 2016.

**NSE - Zero-Based**

Land rights purchases should be booked with the expectation of non-standard escalation due to the fact they are not in themselves pipelines.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00301D**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 3. Line 2001 Looping - Chino to Moreno - R/W acquisit  
 Workpaper Group: 00301D - Line 2001 Looping - Chino to Moreno - R/W acquisition  
 Workpaper Detail: 00301D.001 - Line 2001 Looping - Chino to Moreno - R/W acquisition - 2015 component.  
 In-Service Date: 09/30/2015  
 Description:

Gas Transmission - New Pipelines

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	0
Non-Labor		0	2,000	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>2,000</b>	<b>0</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 3. Line 2001 Looping - Chino to Moreno - R/W acquisit  
 Workpaper Group: 00301D - Line 2001 Looping - Chino to Moreno - R/W acquisition  
 Workpaper Detail: 00301D.002 - Line 2001 Looping - Chino to Moreno - R/W acquisition - 2016 component  
 In-Service Date: 09/30/2016  
 Description:

Gas Transmission - New Pipelines

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	0
Non-Labor		0	0	2,000
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2,000</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00301F - Multiple smaller pipeline projects worked on Blanket W.O.s**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 4. Multiple smaller pipeline projects worked on Blank  
 Workpaper Group: 00301F - Multiple smaller pipeline projects worked on Blanket W.O.s

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	605	452	911
Non-Labor	Zero-Based	0	0	0	0	0	11,198	1,330	9,934
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11,803</b>	<b>1,782</b>	<b>10,845</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	5.6	4.2	8.4

**Business Purpose:**

Provide funding for as-yet unidentified smaller and short-notice new Transmission pipelines.

**Physical Description:**

Multiple smaller Transmission pipeline projects that arise typically on short notice.

**Project Justification:**

These amounts are the difference between larger known new-pipeline projects and the 5-year average for the New Pipelines Budget code. Inasmuch as the forecast for this BC is an average it could be greatly understated especially because amounts spent in 2009 and 2012 were significantly higher than this 5-yr average forecast.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00301.0  
Category: B. New Pipelines (BC 3X1)  
Category-Sub: 4. Multiple smaller pipeline projects worked on Blank  
Workpaper Group: 00301F - Multiple smaller pipeline projects worked on Blanket W.O.s

**Forecast Methodology:**

**Labor - Zero-Based**

The labor content of this forecast is based on the labor percentage of project totals over the last five recorded years.

**Non-Labor - Zero-Based**

The non-labor content of this forecast is the total forecast and the labor estimate as a percentage of the whole.  
Non-labor amounts are expended for materials and contracted labor and construction equipment.

**NSE - Zero-Based**

None. This estimate is for pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00301F**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00301.0  
 Category: B. New Pipelines (BC 3X1)  
 Category-Sub: 4. Multiple smaller pipeline projects worked on Blank  
 Workpaper Group: 00301F - Multiple smaller pipeline projects worked on Blanket W.O.s  
 Workpaper Detail: 00301F.001 - Multiple smaller pipeline projects worked on Blanket W.O.s  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - New Pipelines

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		605	452	911
Non-Labor		11,198	1,330	9,934
NSE		0	0	0
	<b>Total</b>	<b>11,803</b>	<b>1,782</b>	<b>10,845</b>
FTE		5.6	4.2	8.4

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: C. Replacements (BC 3X2)  
Workpaper: 003020

**Summary for Category: C. Replacements (BC 3X2)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	412	706	773	638
Non-Labor	4,304	5,417	5,933	5,181
NSE	0	0	0	0
<b>Total</b>	<b>4,716</b>	<b>6,123</b>	<b>6,706</b>	<b>5,819</b>
FTE	4.0	6.6	7.2	6.0

**003020 GT - Pipeline Replacements**

Labor	412	706	773	638
Non-Labor	4,304	5,417	5,933	5,181
NSE	0	0	0	0
<b>Total</b>	<b>4,716</b>	<b>6,123</b>	<b>6,706</b>	<b>5,819</b>
FTE	4.0	6.6	7.2	6.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**003020 - GT - Pipeline Replacements**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00302.0  
 Category: C. Replacements (BC 3X2)  
 Category-Sub: 1. Replacements  
 Workpaper Group: 003020 - GT - Pipeline Replacements

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	1,785	501	174	314	412	706	773	638
Non-Labor	Zero-Based	7,866	5,891	918	4,642	4,304	5,417	5,933	5,181
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>9,651</b>	<b>6,392</b>	<b>1,091</b>	<b>4,956</b>	<b>4,715</b>	<b>6,123</b>	<b>6,706</b>	<b>5,819</b>
FTE	Zero-Based	16.3	4.4	1.8	3.4	4.0	6.6	7.2	6.0

**Business Purpose:**

This Budget Code includes costs associated with the design and installation of transmission pipeline replacements. Typically, transmission pipelines are replaced due to either condition of the existing pipeline or hazardous condition affecting the existing pipeline location. Pipelines with a history of leakage, poor coating, or that are difficult to cathodically protect are routinely evaluated for possible replacement. Not included in this work paper is the cost impact of D.O.T. mandated pipeline integrity requirements found in CFR 49, Part 192, Subpart 0.

**Physical Description:**

Projects in this Budget Code include the cost to plan, design, permit, acquire materials, construct, commission, and mitigate impacts for the replacement of pipelines, fittings, valves, and associated pressure regulating stations and service lines. Multiple projects are completed each year ranging in size and magnitude from a few feet to several miles of replacement. Projects can involve difficult and hazardous access with many logistical challenges caused by weather or physical terrain. This forecast is for multiple smaller projects varying in scope and pipe size but not qualifying for separate work papers. Also included are projects to replace pipelines due to class location changes.

**Project Justification:**

Estimate is for 2016 is based on an average of the most recent 5 years of recorded costs. Estimates for 2014 and 2015 are slightly higher than the 5 year average and are based on the experience and judgment of local pipeline personnel with knowledge of trends in construction costs and materials performance.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00302.0  
Category: C. Replacements (BC 3X2)  
Category-Sub: 1. Replacements  
Workpaper Group: 003020 - GT - Pipeline Replacements

**Forecast Methodology:**

**Labor - Zero-Based**

2014 and 2015 are zero-based since the Region lists projects whose sum exceeds the 5-yr average. 2016's projects' sum is less than the 5-yr average and is thus rounded up to the 5-yr average in order to provide for projects not yet on the horizon. Labor is a calculated percentage of the direct cost totals based on the most recent 5 years of recorded cost ratios.

**Non-Labor - Zero-Based**

2014 and 2015 are zero-based since the Region lists projects whose sum exceeds the 5-yr average. 2016's projects' sum is less than the 5-yr average and is thus rounded up to the 5-yr average in order to provide for projects not yet on the horizon and to include an incremental amount of \$450K for State Water Resources Industrial General permit renewal.

**NSE - Zero-Based**

None. These are Transmission pipeline projects.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00302.0  
 Category: C. Replacements (BC 3X2)  
 Category-Sub: 1. Replacements  
 Workpaper Group: 003020 - GT - Pipeline Replacements

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	Zero-Based	706	773	638	0	0	0	706	773	638
Non-Labor	Zero-Based	5,417	5,933	5,181	0	0	0	5,417	5,933	5,181
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>6,123</b>	<b>6,706</b>	<b>5,819</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6,123</b>	<b>6,706</b>	<b>5,819</b>
FTE	Zero-Based	6.6	7.2	6.0	0.0	0.0	0.0	6.6	7.2	6.0

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00302.0  
Category: C. Replacements (BC 3X2)  
Category-Sub: 1. Replacements  
Workpaper Group: 003020 - GT - Pipeline Replacements

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	1,231	362	138	380	410
Non-Labor	6,405	5,003	853	6,026	5,151
NSE	0	0	0	0	0
<b>Total</b>	<b>7,635</b>	<b>5,365</b>	<b>991</b>	<b>6,406</b>	<b>5,561</b>
FTE	13.7	3.7	1.5	3.9	3.9
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	-109	-57
Non-Labor	0	0	0	-1,369	-848
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-1,478</b>	<b>-904</b>
FTE	0.0	0.0	0.0	-1.0	-0.5
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	1,231	362	138	271	353
Non-Labor	6,405	5,003	853	4,657	4,304
NSE	0	0	0	0	0
<b>Total</b>	<b>7,635</b>	<b>5,365</b>	<b>991</b>	<b>4,928</b>	<b>4,657</b>
FTE	13.7	3.7	1.5	2.9	3.4
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	222	63	23	43	59
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>222</b>	<b>63</b>	<b>23</b>	<b>43</b>	<b>59</b>
FTE	2.6	0.7	0.3	0.5	0.6
<b>Escalation to 2013\$</b>					
Labor	332	76	12	-1	0
Non-Labor	1,462	888	65	-15	0
NSE	0	0	0	0	0
<b>Total</b>	<b>1,793</b>	<b>964</b>	<b>77</b>	<b>-16</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	1,785	501	174	314	412
Non-Labor	7,866	5,891	918	4,642	4,304
NSE	0	0	0	0	0
<b>Total</b>	<b>9,651</b>	<b>6,392</b>	<b>1,091</b>	<b>4,956</b>	<b>4,715</b>
FTE	16.3	4.4	1.8	3.4	4.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00302.0  
 Category: C. Replacements (BC 3X2)  
 Category-Sub: 1. Replacements  
 Workpaper Group: 003020 - GT - Pipeline Replacements

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	0	-109	-57
Non-Labor		0	0	0	-1,369	-848
NSE		0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-1,478</b>	<b>-904</b>
FTE		0.0	0.0	0.0	-1.0	-0.5

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012</b>	-109	-1,369	0	-1,478	-1.0	MGONZALX20140402112
Adjustment to removed BC 352 from historical costs.						
<b>2012 Total</b>	-109	-1,369	0	-1,478	-1.0	
<b>2013</b>	-57	-848	0	-904	-0.5	MGONZALX20140402112
Adjustment to removed BC 352 from historical costs.						
<b>2013 Total</b>	-57	-848	0	-904	-0.5	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 003020**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00302.0  
 Category: C. Replacements (BC 3X2)  
 Category-Sub: 1. Replacements  
 Workpaper Group: 003020 - GT - Pipeline Replacements  
 Workpaper Detail: 003020.001 - Pipeline replacements due to Class location changes  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Pipeline Replacements - non-PIP
--

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u><b>2014</b></u>	<u><b>2015</b></u>	<u><b>2016</b></u>
Labor		354	0	0
Non-Labor		2,720	0	0
NSE		0	0	0
	<b>Total</b>	<u><b>3,074</b></u>	<u><b>0</b></u>	<u><b>0</b></u>
FTE		3.3	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00302.0  
 Category: C. Replacements (BC 3X2)  
 Category-Sub: 1. Replacements  
 Workpaper Group: 003020 - GT - Pipeline Replacements  
 Workpaper Detail: 003020.002 - Pipeline replacements to meet class location compliance.  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Pipeline Replacements - Non-PIP
--

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u><b>2014</b></u>	<u><b>2015</b></u>	<u><b>2016</b></u>
Labor		352	773	469
Non-Labor		2,697	5,933	3,596
NSE		0	0	0
	<b>Total</b>	<u><b>3,049</b></u>	<u><b>6,706</b></u>	<u><b>4,065</b></u>
FTE		3.3	7.2	4.4

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00302.0  
 Category: C. Replacements (BC 3X2)  
 Category-Sub: 1. Replacements  
 Workpaper Group: 003020 - GT - Pipeline Replacements  
 Workpaper Detail: 003020.004 - GT - Pipeline Replacements - non-PIP - Blanket amount for smaller projects  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Pipeline Replacements - non-PIP

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	169
Non-Labor		0	0	1,585
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,754</b>
FTE		0.0	0.0	1.6

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: D. Freeway Relocations (BC 3X3)  
Workpaper: 003130

**Summary for Category: D. Freeway Relocations (BC 3X3)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	38	38	38
Non-Labor	0	412	412	412
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>450</b>	<b>450</b>	<b>450</b>
FTE	0.0	0.3	0.3	0.3

**003130 GT PL Reloc-Fway / Externally Driven**

Labor	0	38	38	38
Non-Labor	0	412	412	412
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>450</b>	<b>450</b>	<b>450</b>
FTE	0.0	0.3	0.3	0.3

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**003130 - GT PL Reloc-Fway / Externally Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00313.0  
 Category: D. Freeway Relocations (BC 3X3)  
 Category-Sub: 1. Freeway Relocations  
 Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
	<b>Years</b>								
Labor	5-YR Average	162	5	23	0	0	38	38	38
Non-Labor	5-YR Average	1,233	47	767	13	0	412	412	412
NSE	5-YR Average	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>1,395</b>	<b>52</b>	<b>790</b>	<b>13</b>	<b>0</b>	<b>450</b>	<b>450</b>	<b>450</b>
FTE	5-YR Average	1.2	0.0	0.2	0.0	0.0	0.3	0.3	0.3

**Business Purpose:**

This Budget Code includes costs associated with pipeline and associated facility relocations necessitated by Cal Trans construction projects. Included here are historic and forecast costs in Budget Codes 303, 313, 323, and 333.

**Physical Description:**

Relocate and replace pipelines and related facilities found to be in conflict with Cal Trans construction projects. Individual projects will vary from less than \$10,000 to as high as multiple hundreds of thousands of dollars.

**Project Justification:**

Meet operating, right of way, and franchise agreement requirements. Ongoing projects with Cal Trans are not always known during the annual budgeting process. Throughout the year, SoCalGas is frequently required to relocate pipelines during the same year such projects are submitted to SoCalGas. Costs are driven by safety and regulatory compliance as well as contractual requirements.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00313.0  
Category: D. Freeway Relocations (BC 3X3)  
Category-Sub: 1. Freeway Relocations  
Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven

**Forecast Methodology:**

**Labor - 5-YR Average**

Estimate for labor is established according to the 5-yr recorded percentage of project direct costs. Spending in this category varies considerably from year to year. This forecast is estimated at the 5-yr average. Projects are typically 50% collectible unless Line is in R/W in which it is 100% collectible. Estimating overall 50% collectibility here.

**Non-Labor - 5-YR Average**

This forecast is estimated at the 5-yr average. Projects are typically 50% collectible unless Line is in R/W in which it is 100% collectible. Estimating overall 50% collectibility here.

**NSE - 5-YR Average**

None. These costs are for Transmission pipeline relocations.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00313.0  
 Category: D. Freeway Relocations (BC 3X3)  
 Category-Sub: 1. Freeway Relocations  
 Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	5-YR Average	38	38	38	0	0	0	38	38	38
Non-Labor	5-YR Average	411	411	411	0	0	0	411	411	411
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>449</b>	<b>449</b>	<b>449</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>449</b>	<b>449</b>	<b>449</b>
FTE	5-YR Average	0.3	0.3	0.3	0.0	0.0	0.0	0.3	0.3	0.3

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00313.0  
Category: D. Freeway Relocations (BC 3X3)  
Category-Sub: 1. Freeway Relocations  
Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	112	4	18	0	0
Non-Labor	1,004	40	713	13	0
NSE	0	0	0	0	0
<b>Total</b>	<b>1,115</b>	<b>44</b>	<b>731</b>	<b>13</b>	<b>0</b>
FTE	1.0	0.0	0.2	0.0	0.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	112	4	18	0	0
Non-Labor	1,004	40	713	13	0
NSE	0	0	0	0	0
<b>Total</b>	<b>1,115</b>	<b>44</b>	<b>731</b>	<b>13</b>	<b>0</b>
FTE	1.0	0.0	0.2	0.0	0.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	20	1	3	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>20</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>
FTE	0.2	0.0	0.0	0.0	0.0
<b>Escalation to 2013\$</b>					
Labor	30	1	2	0	0
Non-Labor	229	7	54	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>259</b>	<b>8</b>	<b>56</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	162	5	23	0	0
Non-Labor	1,233	47	767	13	0
NSE	0	0	0	0	0
<b>Total</b>	<b>1,395</b>	<b>52</b>	<b>790</b>	<b>13</b>	<b>0</b>
FTE	1.2	0.0	0.2	0.0	0.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00313.0  
 Category: D. Freeway Relocations (BC 3X3)  
 Category-Sub: 1. Freeway Relocations  
 Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	0	0	0
Non-Labor		0	0	0	0	0
NSE		0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 003130**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00313.0  
 Category: D. Freeway Relocations (BC 3X3)  
 Category-Sub: 1. Freeway Relocations  
 Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven  
 Workpaper Detail: 003130.001 - Pipeline relocations due to Freeway projects - Collectible portion (50%)  
 In-Service Date: Not Applicable  
 Description:

Forecast In 2013 \$(000)				
	Years	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		19	19	19
Non-Labor		205	205	205
NSE		0	0	0
	<b>Total</b>	<b>224</b>	<b>224</b>	<b>224</b>
FTE		0.1	0.1	0.1

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00313.0  
 Category: D. Freeway Relocations (BC 3X3)  
 Category-Sub: 1. Freeway Relocations  
 Workpaper Group: 003130 - GT PL Reloc-Fway / Externally Driven  
 Workpaper Detail: 003130.002 - Pipeline relocations due to Freeway projects - non-collectible portion (50%)  
 In-Service Date: Not Applicable  
 Description:

Forecast In 2013 \$(000)					
Years		2014	2015	2016	
Labor		19	19	19	
Non-Labor		207	207	207	
NSE		0	0	0	
	<b>Total</b>	<b>226</b>	<b>226</b>	<b>226</b>	
FTE		0.2	0.2	0.2	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Workpaper: VARIOUS

**Summary for Category: E. Relocations - Private/Franchise (BC 3X4)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	1,017	471	905
Non-Labor	0	8,862	4,201	7,886
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>9,879</b>	<b>4,672</b>	<b>8,791</b>
FTE	0.0	9.5	4.5	8.5

**00314A Line 2001 Relocation - Nogales**

Labor	0	558	0	0
Non-Labor	0	4,863	0	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>5,421</b>	<b>0</b>	<b>0</b>
FTE	0.0	5.2	0.0	0.0

**00314C Westside Parkway - Line 7039 at Renfro Rd. N/O Stockdale.**

Labor	0	171	0	0
Non-Labor	0	1,490	0	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,661</b>	<b>0</b>	<b>0</b>
FTE	0.0	1.6	0.0	0.0

**00314D Fairway Drive Grade Separation - Line 2001**

Labor	0	146	0	0
Non-Labor	0	1,274	0	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,420</b>	<b>0</b>	<b>0</b>
FTE	0.0	1.4	0.0	0.0

**00314F Fullerton Rd Grade Separation - Line 2001**

Labor	0	21	92	0
Non-Labor	0	182	801	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>203</b>	<b>893</b>	<b>0</b>
FTE	0.0	0.2	0.9	0.0

**00314G Lines 1017 & 1018 Grand Ave. Grade Separation**

Labor	0	0	104	522
Non-Labor	0	0	910	4,550
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,014</b>	<b>5,072</b>
FTE	0.0	0.0	1.0	4.9

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Workpaper: VARIOUS

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
<b>00314H Riverside Airport - Line 2001 Relocation</b>				
Labor	0	121	88	0
Non-Labor	0	1,053	767	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,174</b>	<b>855</b>	<b>0</b>
FTE	0.0	1.1	0.8	0.0
<b>00314J Line 1167 Relocation - Ballona Wetlands Restoration Project</b>				
Labor	0	0	49	277
Non-Labor	0	0	427	2,417
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>476</b>	<b>2,694</b>
FTE	0.0	0.0	0.5	2.6
<b>00314K Farmland Relocations</b>				
Labor	0	0	106	106
Non-Labor	0	0	919	919
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,025</b>	<b>1,025</b>
FTE	0.0	0.0	1.0	1.0
<b>00314I Gas Engineering - Pipeline Relocations - Franchise/Private - Blanket Projects</b>				
Labor	0	0	32	0
Non-Labor	0	0	377	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>409</b>	<b>0</b>
FTE	0.0	0.0	0.3	0.0

Note: Totals may include rounding differences.

**Beginning of Workpaper Group**  
**00314A - Line 2001 Relocation - Nogales**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 1. Line 2001 Relocation - Nogales  
 Workpaper Group: 00314A - Line 2001 Relocation - Nogales

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	558	0	0
Non-Labor	Zero-Based	0	0	0	0	0	4,863	0	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,421</b>	<b>0</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0

**Business Purpose:**

This Budget Code includes costs associated with the modification and relocation of transmission pipelines to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way agreements, contract and franchise requirements. The City of Industry is planning a grade separation project along Nogales Street, causing the Gas Company to relocate approximately 2000 feet of Line 2001, which is in direct conflict with the retaining wall.

**Physical Description:**

Procure, permit, and install approximately 2000 feet of 30 inch Line 2001 in the City of Industry. Remove 560 feet of existing 30 inch L-2001. This project is estimated to be approximately 43% collectible. The City had requested that all utilities relocation work be completed by the end of 2009, however, due to property rights issues this date has been futureed to 2014.

**Project Justification:**

Pipelines are relocated according to the requirements of municipal franchises and property developers. Some are collectible and others are not, usually depending on rights of way language. Collectibility in these types of relocations rests wholly in the subject of the pipelines' prior rights.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 1. Line 2001 Relocation - Nogales  
Workpaper Group: 00314A - Line 2001 Relocation - Nogales

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These are pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314A**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 1. Line 2001 Relocation - Nogales  
 Workpaper Group: 00314A - Line 2001 Relocation - Nogales  
 Workpaper Detail: 00314A.001 - Line Relocation - 43% collectible - this is non-collected portion  
 In-Service Date: 09/30/2014  
 Description:

Gas Transmission - Pipeline Relocations - Franchise & Private

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		318	0	0
Non-Labor		2,772	0	0
NSE		0	0	0
	<b>Total</b>	<b>3,090</b>	<b>0</b>	<b>0</b>
FTE		3.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 1. Line 2001 Relocation - Nogales  
 Workpaper Group: 00314A - Line 2001 Relocation - Nogales  
 Workpaper Detail: 00314A.002 - Line Relocation - 43% collectible - this is the collectible portion  
 In-Service Date: 09/30/2014  
 Description:

Gas Transmission - Pipeline Relocations - Franchise & Private

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
Labor		240	0	0
Non-Labor		2,091	0	0
NSE		0	0	0
	<b>Total</b>	<b>2,331</b>	<b>0</b>	<b>0</b>
FTE		2.2	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00314C - Westside Parkway - Line 7039 at Renfro Rd. N/O Stockdale.**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 2. Westside Parkway - Line 7039 at Renfro Rd. N/O Sto  
 Workpaper Group: 00314C - Westside Parkway - Line 7039 at Renfro Rd. N/O Stockdale.

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	171	0	0
Non-Labor	Zero-Based	0	0	0	0	0	1,490	0	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,661</b>	<b>0</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0

**Business Purpose:**

Relocate Line 7039 in the City of Bakersfield Westside Parkway and Renfro Road due to roadway reconstruction.

**Physical Description:**

24" Line 7039 is now located within Renfro Road. The City of Bakersfield plans to develop Westside Parkway which crosses Renfro Road. The Renfro Road crossing will be an Overcrossing. The pipeline will require relocation into a cell within the newly constructed bridge crossing Renfro Road. The pipeline relocation will consist of 30" casing pipe and 24" carrier pipe.

**Project Justification:**

The existing 24" pipeline must be relocated by SoCalGas because it is in direct conflict with roadway construction and is installed under terms of our franchise with the City of Bakersfield. The City had originally requested utilities work to be complete by 3rd quarter 2010 but due to delays by the City the work is requested to be complete in 2014.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 2. Westside Parkway - Line 7039 at Renfro Rd. N/O Sto  
Workpaper Group: 00314C - Westside Parkway - Line 7039 at Renfro Rd. N/O Stockdale.

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These are pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314C**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 2. Westside Parkway - Line 7039 at Renfro Rd. N/O Sto  
 Workpaper Group: 00314C - Westside Parkway - Line 7039 at Renfro Rd. N/O Stockdale.  
 Workpaper Detail: 00314C.001 - Non-collectible relocation of Transmission Line  
 In-Service Date: 12/31/2014  
 Description:

Forecast In 2013 \$(000)					
Years		2014	2015	2016	
Labor		171	0	0	
Non-Labor		1,490	0	0	
NSE		0	0	0	
	<b>Total</b>	<b>1,661</b>	<b>0</b>	<b>0</b>	
FTE		1.6	0.0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00314D - Fairway Drive Grade Separation - Line 2001**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 3. Fairway Drive Grade Separation - Line 2001  
 Workpaper Group: 00314D - Fairway Drive Grade Separation - Line 2001

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	146	0	0
Non-Labor	Zero-Based	0	0	0	0	0	1,274	0	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,420</b>	<b>0</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.0

**Business Purpose:**

This Budget Code includes costs associated with the modification and relocation of transmission pipelines to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way agreements, contract and franchise requirements.

**Physical Description:**

Relocate approximately 845 feet of 30 inch Line 2001 to accommodate grade separation of Fairway Drive at the UPRR tracks in the City of Industry. Remove approximately 210 feet of abandoned 30 inch pipe.

**Project Justification:**

Relocating this portion of Line 2001 allows for new grade separation at Fairway Drive in the City of Industry. The project is 80% collectible. Work is being performed for the Alameda Corridor - East Construction Authority.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 3. Fairway Drive Grade Separation - Line 2001  
Workpaper Group: 00314D - Fairway Drive Grade Separation - Line 2001

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These are pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314D**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 3. Fairway Drive Grade Separation - Line 2001  
 Workpaper Group: 00314D - Fairway Drive Grade Separation - Line 2001  
 Workpaper Detail: 00314D.001 - Line relocation - 80% collectible - This is non-collectible portion.  
 In-Service Date: 12/31/2014  
 Description:

Forecast In 2013 \$(000)				
Years	2014	2015	2016	
Labor	29	0	0	
Non-Labor	255	0	0	
NSE	0	0	0	
<b>Total</b>	<b>284</b>	<b>0</b>	<b>0</b>	
FTE	0.3	0.0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 3. Fairway Drive Grade Separation - Line 2001  
 Workpaper Group: 00314D - Fairway Drive Grade Separation - Line 2001  
 Workpaper Detail: 00314D.002 - Line Relocation - 80% collectible - this is the collectible portion  
 In-Service Date: 12/31/2014  
 Description:

Gas Transmission - Pipeline Relocations - Private & Franchise

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		117	0	0
Non-Labor		1,019	0	0
NSE		0	0	0
	<b>Total</b>	<b>1,136</b>	<b>0</b>	<b>0</b>
FTE		1.1	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00314F - Fullerton Rd Grade Separation - Line 2001**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 4. Fullerton Rd Grade Separation - Line 2001  
 Workpaper Group: 00314F - Fullerton Rd Grade Separation - Line 2001

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	21	92	0
Non-Labor	Zero-Based	0	0	0	0	0	182	801	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>203</b>	<b>893</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.2	0.9	0.0

**Business Purpose:**

This Budget Code includes costs associated with the modification and relocation of transmission pipelines to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way agreements, contract and franchise requirements.  
 Relocate Line 2001 in Fullerton Rd. in the City of Industry to accommodate a grade separation from the UPRR tracks.

**Physical Description:**

Relocate approximately 325 feet of 30 inch Transmission line 2001. Install casing piping & remove the abandoned existing line.

**Project Justification:**

This work is required by franchise agreement with the Alameda Corridor - East Construction Authority (ACE). Casing and groundwater removal to be provided by ACE.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 4. Fullerton Rd Grade Separation - Line 2001  
Workpaper Group: 00314F - Fullerton Rd Grade Separation - Line 2001

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These are pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314F**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 4. Fullerton Rd Grade Separation - Line 2001  
 Workpaper Group: 00314F - Fullerton Rd Grade Separation - Line 2001  
 Workpaper Detail: 00314F.001 - Non-Collectible Transmission Line Relocation  
 In-Service Date: 06/30/2015  
 Description:

Forecast In 2013 \$(000)					
Years		2014	2015	2016	
Labor		21	92	0	
Non-Labor		182	801	0	
NSE		0	0	0	
	<b>Total</b>	<b>203</b>	<b>893</b>	<b>0</b>	
FTE		0.2	0.9	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00314G - Lines 1017 & 1018 Grand Ave. Grade Separation**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 5. Lines 1017 & 1018 Grand Ave. Grade Separation  
 Workpaper Group: 00314G - Lines 1017 & 1018 Grand Ave. Grade Separation

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	104	522
Non-Labor	Zero-Based	0	0	0	0	0	0	910	4,550
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,014</b>	<b>5,072</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	1.0	4.9

**Business Purpose:**

This Budget Code includes costs associated with the modification and relocation of transmission pipelines to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way agreements, contract and franchise requirements.  
 Relocate paralleling Lines 1017 and 1018 in Grand Ave. in the City of Santa Ana to allow grade separation from the ATSF/Metrolink tracks s/o Chestnut Ave.

**Physical Description:**

Relocate approximately 300 feet each of 24 and 30 inch Transmission lines 1017 and 1018. Install casing and remove existing piping.

**Project Justification:**

This project is required under terms of franchise agreements with the City of Santa Ana and the Orange County Transportation authority (OCTA).

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 5. Lines 1017 & 1018 Grand Ave. Grade Separation  
Workpaper Group: 00314G - Lines 1017 & 1018 Grand Ave. Grade Separation

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These are pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314G**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 5. Lines 1017 & 1018 Grand Ave. Grade Separation  
 Workpaper Group: 00314G - Lines 1017 & 1018 Grand Ave. Grade Separation  
 Workpaper Detail: 00314G.001 - Non-collectible Transmission Line relocation  
 In-Service Date: 06/30/2016  
 Description:

Gas Transmission - Pipeline Relocations.

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	104	522
Non-Labor		0	910	4,550
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>1,014</b>	<b>5,072</b>
FTE		0.0	1.0	4.9

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00314H - Riverside Airport - Line 2001 Relocation**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 6. Riverside Airport - Line 2001 Relocation  
 Workpaper Group: 00314H - Riverside Airport - Line 2001 Relocation

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
	<b>Years</b>								
Labor	Zero-Based	0	0	0	0	0	121	88	0
Non-Labor	Zero-Based	0	0	0	0	0	1,053	767	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,174</b>	<b>855</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	1.1	0.8	0.0

**Business Purpose:**

Riverside Municipal Airport has requested the Gas Company to relocate approximately 3,000 feet of 30-inch gas main to make way for extension of the main runway.

**Physical Description:**

This project consists of design, permit and construct approximately 3000 feet of 30 inch gas main. This project also includes the removal of approximately 1,600 and the abandonment of 1,400 feet of existing 30 inch Line 2001.

**Project Justification:**

This relocation is 100% collectible due to the pipeline's prior rights and is required in order to accommodate the Airport's runway extension. This project was originally slated for the 2010-2012 time frame but underwent several City planning delays and is now expected to begin in 2014.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 6. Riverside Airport - Line 2001 Relocation  
Workpaper Group: 00314H - Riverside Airport - Line 2001 Relocation

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These are pipeline construction projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314H**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 6. Riverside Airport - Line 2001 Relocation  
 Workpaper Group: 00314H - Riverside Airport - Line 2001 Relocation  
 Workpaper Detail: 00314H.001 - Riverside Airport - Line 2001 relocation  
 In-Service Date: 09/30/2015  
 Description:

Gas Transmission - Pipeline Relocations.

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		121	88	0
Non-Labor		1,053	767	0
NSE		0	0	0
	<b>Total</b>	<b>1,174</b>	<b>855</b>	<b>0</b>
FTE		1.1	0.8	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00314J - Line 1167 Relocation - Ballona Wetlands Restoration Project**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 7. Gas Engineering - Pipeline Relocations - Franchise  
 Workpaper Group: 00314J - Line 1167 Relocation - Ballona Wetlands Restoration Project

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	49	277
Non-Labor	Zero-Based	0	0	0	0	0	0	427	2,417
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>476</b>	<b>2,694</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.5	2.6

**Business Purpose:**

Comply with governmental requirement to relocate Transmission Line 1167 from its Ballona Wetlands location for the purpose of its restoration to franchise location in Culver drive and Jefferson Blvd.

**Physical Description:**

Abandon approx. 2,000 ft. of 30" Line 1167 and construct new line in franchise public streets remote from the wetlands.

**Project Justification:**

This relocation is mandated by the governmental agency managing the Ballona wetlands. Non collectible due to the language of the existing easement.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 7. Gas Engineering - Pipeline Relocations - Franchise  
Workpaper Group: 00314J - Line 1167 Relocation - Ballona Wetlands Restoration Project

**Forecast Methodology:**

**Labor - Zero-Based**

Labor content is based on 5 years of recorded experience in this BC.

**Non-Labor - Zero-Based**

This project was estimated based on recent recorded projects of similar pipe size, location and scope and done by experienced pipeline estimating personnel

**NSE - Zero-Based**

None. This is a Transmission asset capital project.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314J**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 7. Gas Engineering - Pipeline Relocations - Franchise  
 Workpaper Group: 00314J - Line 1167 Relocation - Ballona Wetlands Restoration Project  
 Workpaper Detail: 00314J.001 - Line 1167 Relocation - Ballona Wetlands Restoration Project  
 In-Service Date: 09/30/2016  
 Description:

Gas Transmission - Pipeline Relocations - Private/Franchise
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<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u><b>2014</b></u>	<u><b>2015</b></u>	<u><b>2016</b></u>
Labor		0	49	277
Non-Labor		0	427	2,417
NSE		0	0	0
	<b>Total</b>	<u><b>0</b></u>	<u><b>476</b></u>	<u><b>2,694</b></u>
FTE		0.0	0.5	2.6

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group  
00314K - Farmland Relocations**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 8. Farmland Relocations  
 Workpaper Group: 00314K - Farmland Relocations

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	106	106
Non-Labor	Zero-Based	0	0	0	0	0	0	919	919
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,025</b>	<b>1,025</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0

**Business Purpose:**

Based on recent experience there will continue the need to relocate at least two Transmission pipeline segments per year due to shallow depth under fields used for agriculture which causes them to be vulnerable to significant damage by plows and/or other implements.

**Physical Description:**

This estimate is based on the most recent farmland relocation that occurred in the Somis area which was approximately 750 ft. of 15" transmission pipeline.

**Project Justification:**

Many Transmission pipelines were originally installed across grazing land that was subsequently converted to agriculture. Although these lines were originally installed at sufficient depth, subsequent grading to create level fields plus the natural process of erosion caused by wind and rainwater/irrigation runoff causes such lines to become shallow and vulnerable to damage. Some may be subject to collection but it is thought most will not due to Right-of-Way language or the expected challenges made by landowners suddenly presented with the issue of shallow depth they or a previous owner might have created many years prior.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 8. Farmland Relocations  
Workpaper Group: 00314K - Farmland Relocations

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of this estimate is based on five years of recorded activity in this BC as to the labor portion of recorded costs.

**Non-Labor - Zero-Based**

This estimate is based on a recent recorded job worked in the Somis area in which the costs were \$504.9K. This estimate is for two similar jobs per year and to which Vacation & Sick costs have been added to Labor.

**NSE - Zero-Based**

None. These are Transmission Pipeline projects.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314K**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 8. Farmland Relocations  
 Workpaper Group: 00314K - Farmland Relocations  
 Workpaper Detail: 00314K.001 - Farmland Relocations - 2015 Projects  
 In-Service Date: 09/30/2015  
 Description:

Gas Transmission - Pipeline Relocations - Franchise/Private

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	106	0
Non-Labor		0	919	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>1,025</b>	<b>0</b>
FTE		0.0	1.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 8. Farmland Relocations  
 Workpaper Group: 00314K - Farmland Relocations  
 Workpaper Detail: 00314K.002 - Farmland Relocations - 2016 Projects (2)  
 In-Service Date: 09/30/2016  
 Description:

Gas Transmission - Pipeline Relocations - Franchise/Private
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<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		0	0	106
Non-Labor		0	0	919
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,025</b>
FTE		0.0	0.0	1.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**

**00314I - Gas Engineering - Pipeline Relocations - Franchise/Private - Blanket Projects**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 9. Gas Eng - Pipe Reloc - Franchise/Priv - Blnkt Proj  
 Workpaper Group: 00314I - Gas Engineering - Pipeline Relocations - Franchise/Private - Blanket Projects

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	32	0
Non-Labor	Zero-Based	0	0	0	0	0	0	377	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>409</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0

**Business Purpose:**

This Budget Code includes costs associated with the modification and relocation of transmission pipelines to accommodate planned private property development, municipal public works and street improvement projects, and other work required due to right-of-way agreements, contract and franchise requirements.

**Physical Description:**

This Budget Code contains forecasts for a number of pipeline relocation projects required to meet the regulatory requirements or contract clauses of operating, right of way, franchise, and 3rd party developer agreements. Specific projects with cities and developers are not always clear during the annual budgeting process. These projects can range in magnitude from less than one hundred feet of pipe to accommodate a storm drain or sewer installation to several miles of relocated pipe, fittings, valves and appurtenances needed to accommodate residential development over large tracts of previously undeveloped land throughout our service territory. Throughout the year, SoCalGas can be required to relocate pipelines during the same year the request is received by SoCalGas due to the immediate needs of third party developers or municipal agencies.

Individual projects in this budget code can vary in cost from less than \$10,000 to as high as several hundreds of thousands of dollars.

**Project Justification:**

Pipelines are relocated according to the requirements of municipal franchises and property developers. Some are collectible and others are not, usually depending on rights of way language. Estimated years are an average of the most recent three recorded years less specific projects known to be upcoming.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00314.0  
Category: E. Relocations - Private/Franchise (BC 3X4)  
Category-Sub: 9. Gas Eng - Pipe Reloc - Franchise/Priv - Blnkt Proj  
Workpaper Group: 00314I - Gas Engineering - Pipeline Relocations - Franchise/Private - Blanket Projects

**Forecast Methodology:**

**Labor - Zero-Based**

The labor content of this estimate is based on five years' recorded costs in this BC.

**Non-Labor - Zero-Based**

Forecasts for 2014 and 2016 are based on the five-year capital plan for this Budget Category. 2015 is based on a five-year average of costs in this Budget Category, 2009-2013. The amounts shown here are the differences between amounts for known projects and the aforementioned five-year average.

**NSE - Zero-Based**

None. These are Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00314I**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00314.0  
 Category: E. Relocations - Private/Franchise (BC 3X4)  
 Category-Sub: 9. Gas Eng - Pipe Reloc - Franchise/Priv - Blnkt Proj  
 Workpaper Group: 00314I - Gas Engineering - Pipeline Relocations - Franchise/Private - Blanket Projects  
 Workpaper Detail: 00314I.001 - Gas Engineering - Pipeline Relocations - Franchise/Private - Blanket Projects  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Pipeline Relocations - Franchise/Private
---

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		0	32	0
Non-Labor		0	377	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>409</b>	<b>0</b>
FTE		0.0	0.3	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: F. Compressor Stations (BC 3X5)  
Workpaper: VARIOUS

**Summary for Category: F. Compressor Stations (BC 3X5)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	624	1,584	2,771
Non-Labor	0	9,259	30,666	76,868
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>9,883</b>	<b>32,250</b>	<b>79,639</b>
FTE	0.0	6.2	15.7	27.4

**00305A Transmission Operations - Newberry Springs - Power Generation**

Labor	0	168	0	0
Non-Labor	0	1,376	0	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,544</b>	<b>0</b>	<b>0</b>
FTE	0.0	1.7	0.0	0.0

**00305B Air Quality Retrofits (Rule 1160) & Update obsolete equipment.**

Labor	0	274	913	870
Non-Labor	0	4,739	15,785	15,038
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>5,013</b>	<b>16,698</b>	<b>15,908</b>
FTE	0.0	2.7	9.0	8.6

**00305E M&R - Wheeler Ridge Controls & Sensors upgrades**

Labor	0	171	162	6
Non-Labor	0	2,953	2,791	95
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>3,124</b>	<b>2,953</b>	<b>101</b>
FTE	0.0	1.7	1.6	0.1

**00305F Compressor change outs for reliability & capacity. VENTURA STATION**

Labor	0	0	131	834
Non-Labor	0	0	4,387	28,021
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>4,518</b>	<b>28,855</b>
FTE	0.0	0.0	1.3	8.2

**00305G Compressor change outs for reliability & capacity - BLYTHE**

Labor	0	0	73	943
Non-Labor	0	0	2,437	31,687
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>2,510</b>	<b>32,630</b>
FTE	0.0	0.0	0.7	9.3

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: F. Compressor Stations (BC 3X5)  
Workpaper: VARIOUS

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
<b>00305H Compressor change outs for reliability &amp; capacity - N &amp; S NEEDLES</b>				
Labor	0	0	107	107
Non-Labor	0	0	1,836	1,836
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1,943</b>	<b>1,943</b>
FTE	0.0	0.0	1.1	1.1
<b>00305I Compressor change outs for Reliability &amp; capacity - KELSO</b>				
Labor	0	0	187	0
Non-Labor	0	0	3,239	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>3,426</b>	<b>0</b>
FTE	0.0	0.0	1.9	0.0
<b>00305J Multiple M&amp;R projects for Controls &amp; Upgrades - Blanket</b>				
Labor	0	11	11	11
Non-Labor	0	191	191	191
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>202</b>	<b>202</b>	<b>202</b>
FTE	0.0	0.1	0.1	0.1

Note: Totals may include rounding differences.

**Beginning of Workpaper Group**  
**00305A - Transmission Operations - Newberry Springs - Power Generation**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 1. Transmission Operations - Newberry Springs - Power  
 Workpaper Group: 00305A - Transmission Operations - Newberry Springs - Power Generation

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	168	0	0
Non-Labor	Zero-Based	0	0	0	0	0	1,376	0	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,544</b>	<b>0</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0

**Business Purpose:**

This Budget Code includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to sustain the reliability and safety of the facility. To keep operating costs down, reliance is made on automating data gathering systems to monitor performance data such as flows, pressures, and temperatures. The upgrade and replacement of controls consisting of out dated technology is critical to enable the station to operate at its highest efficiency and that proper testing and diagnostics can be executed when the engine units are down. New air quality regulations require emissions monitoring and reporting equipment along with new catalyst and combustion technology to meet lower emission levels.

**Physical Description:**

Individual project scopes can consist of one or a combination of the following installations: replacing the pneumatic and electro-mechanical control systems and related station auxiliary systems, installation of new engine control panels, new station control panel and replacement of sensors, wiring, industrial communications and local controllers. New Programmable Logic Controllers, local control networks, operator interfaces, continuous emissions monitoring (CEMS), pre combustion chambers, and new catalysts.

This project is to replace electrical power generation capacity at the Newberry Springs Compressor facility. Add ten 200kw Capstone microturbines, controls and all equipment necessary to completely switch to this new power generation system.

**Project Justification:**

The existing Waukasha generators and associated equipment will be abandoned and removed as part of the scope of this project. The new Capstone generators will reduce greenhouse gas emissions in order to meet EPA ruling.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 1. Transmission Operations - Newberry Springs - Power  
Workpaper Group: 00305A - Transmission Operations - Newberry Springs - Power Generation

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of this estimate was calculated using the average of labor contained in the most recent five years of recorded activity in this BC.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair, if any. Such costs are estimated by experienced pipeline construction management personnel using reference to recent Compressor Station construction projects of similar scope, equipment type, and construction environment.

**NSE - Zero-Based**

None. Compressor stations are Gas Transmission capital assets that are pipeline-related.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305A**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 1. Transmission Operations - Newberry Springs - Power  
 Workpaper Group: 00305A - Transmission Operations - Newberry Springs - Power Generation  
 Workpaper Detail: 00305A.001 - Transmission Operations - Replace electrical power generation a Newberry Springs  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Compressor Stations.

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		168	0	0
Non-Labor		1,376	0	0
NSE		0	0	0
	<b>Total</b>	<b>1,544</b>	<b>0</b>	<b>0</b>
FTE		1.7	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00305B - Air Quality Retrofits (Rule 1160) & Update obsolete equipment.**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 2. Air Quality Retrofits (Rule 1160) & Update obsolete  
 Workpaper Group: 00305B - Air Quality Retrofits (Rule 1160) & Update obsolete equipment.

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	274	913	870
Non-Labor	Zero-Based	0	0	0	0	0	4,739	15,785	15,038
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5,013</b>	<b>16,698</b>	<b>15,908</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	2.7	9.0	8.6

**Business Purpose:**

This Budget Code includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to sustain the reliability and safety of the facility. To keep operating costs down, reliance is made on automating data gathering systems to monitor performance data such as flows, pressures, and temperatures. The upgrade and replacement of controls consisting of out dated technology is critical to enable the station to operate at its highest efficiency and that proper testing and diagnostics can be executed when the engine units are down. New air quality regulations require emissions monitoring and reporting equipment along with new catalyst and combustion technology to meet lower emission levels.

SoCalGas compressor stations in the Mojave air district are also subject to Mojave Desert Air Quality Management District (MDAQMD) Rule 1160, which regulates NOx, CO, and VOC emission limits. The cost of compliance with Rule 1160 in 2014 (at the North Needles site) is included in that year and constitutes approximately \$1,650 million of the total direct shown above. The remaining \$28.1M for Rule 1160 compliance is spread evenly over 2015 and 2016.

**Physical Description:**

Individual project scopes can consist of one or a combination of the following installations: replacing the pneumatic and electro-mechanical control systems and related station auxiliary systems, installation of new engine control panels, new station control panel and replacement of sensors, wiring, industrial communications and local controllers. Emissions-related equipments includes: non-selective catalytic reduction (NSCR), Air/fuel ration controllers (AFRC), pre-combustion chambers (ePCC), condensate particulate matter (CPM) filters, turbocharging, and cooling modifications.

**Project Justification:**

Compressor engine components have a finite life requiring regular replacement and/or upgrade as recommended by the manufacturer to sustain reliability and transportation ability for the Southern California market. For older stations where existing control and auxiliary equipment technology are outdated, replacements are required to interface with newer data acquisition systems and air quality mandated emission system upgrades.

As previously mentioned, the air quality rules that govern emission standards are being revised at both the federal and local levels in the Mojave Air District jurisdiction. Rule 1160 reduces NOx, CO, and VOC limits. While specific technology is required on the various engines throughout the air district in order to comply with the revised rules, the available technology overlaps to achieve compliance with Rule 1160.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 2. Air Quality Retrofits (Rule 1160) & Update obsolete  
Workpaper Group: 00305B - Air Quality Retrofits (Rule 1160) & Update obsolete equipment.

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the most recent five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor and were estimated here on a site-specific basis which recognizes the requirements for each engine. Such costs are estimated by experienced compressor station management personnel using reference to recent compressor engine retrofit projects of similar scope, equipment type and construction environment.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305B**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 2. Air Quality Retrofits (Rule 1160) & Update obsolete  
 Workpaper Group: 00305B - Air Quality Retrofits (Rule 1160) & Update obsolete equipment.  
 Workpaper Detail: 00305B.001 - Air Quality Retrofits (Rule 1160) & Update obsolete equipment - 2014 retrofit of North  
 In-Service Date: 09/30/2014  
 Description:

Gas Transmission - Compressor Stations

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		274	0	0
Non-Labor		4,739	0	0
NSE		0	0	0
	<b>Total</b>	<b>5,013</b>	<b>0</b>	<b>0</b>
FTE		2.7	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 2. Air Quality Retrofits (Rule 1160) & Update obsolete  
 Workpaper Group: 00305B - Air Quality Retrofits (Rule 1160) & Update obsolete equipment.  
 Workpaper Detail: 00305B.002 - Air Quality Retrofits (Rule 1160) & obsolete equipment upgrades - 2015 engine retrofits  
 In-Service Date: 09/30/2015  
 Description:

Gas Transmission - Compressor Stations

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	913	0
Non-Labor		0	15,785	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>16,698</b>	<b>0</b>
FTE		0.0	9.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 2. Air Quality Retrofits (Rule 1160) & Update obsolete  
 Workpaper Group: 00305B - Air Quality Retrofits (Rule 1160) & Update obsolete equipment.  
 Workpaper Detail: 00305B.003 - Air Quality Retrofits (Rule 1160) & upgrade obsolete equipment - 2016 engine retrofits  
 In-Service Date: 09/30/2016

Description:

Gas Transmission - Compressor Stations
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<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		0	0	870
Non-Labor		0	0	15,038
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>15,908</b>
FTE		0.0	0.0	8.6

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00305E - M&R - Wheeler Ridge Controls & Sensors upgrades**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 3. M&R - Wheeler Ridge Controls & Sensors upgrades  
 Workpaper Group: 00305E - M&R - Wheeler Ridge Controls & Sensors upgrades

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	171	162	6
Non-Labor	Zero-Based	0	0	0	0	0	2,953	2,791	95
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,124</b>	<b>2,953</b>	<b>101</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	1.7	1.6	0.1

**Business Purpose:**

This Budget Code includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to sustain the reliability and safety of the facility. To keep operating costs down, reliance is made on automating data gathering systems to monitor performance data such as flows, pressures, and temperatures. The upgrade and replacement of controls consisting of out dated technology is critical to enable the station to operate at its highest efficiency and that proper testing and diagnostics can be executed when the engine units are down.

**Physical Description:**

This project replaces/upgrades electronic control system components and associated operating panels on four (4) Solar Saturn Gas turbines and related compressor station controls, including gas cooling, station valving and emission control interfaces. Station was installed in 1992 and current electronic control system components are 22+ years old. Specific replacements to include new programmable logic controllers, wiring, modules for reading and controlling field instruments, operator interface control panels, fuel and mode control valves/metering, power supplies, back-up battery systems, and software to optimize engine performance and emissions.

**Project Justification:**

See Physical Description. Work is needed to replaced aging equipment prior to steep decline in reliability and to contend with equipment which is no longer actively supported by (or available from) suppliers. Work sustains station availability and reliability.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 3. M&R - Wheeler Ridge Controls & Sensors upgrades  
Workpaper Group: 00305E - M&R - Wheeler Ridge Controls & Sensors upgrades

**Forecast Methodology:**

**Labor - Zero-Based**

Cost forecasts were prepared by experienced personnel familiar with several recently completed controls upgrade projects. The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor. Such costs are estimated by experienced pipeline construction management personnel using reference to recent compressor station controls upgrade projects.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305E**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 3. M&R - Wheeler Ridge Controls & Sensors upgrades  
 Workpaper Group: 00305E - M&R - Wheeler Ridge Controls & Sensors upgrades  
 Workpaper Detail: 00305E.001 - M&R - Wheeler controls & sensors upgrades  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Compressor Stations

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		171	162	6
Non-Labor		2,953	2,791	95
NSE		0	0	0
	<b>Total</b>	<b>3,124</b>	<b>2,953</b>	<b>101</b>
FTE		1.7	1.6	0.1

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00305F - Compressor change outs for reliability & capacity. VENTURA STATION**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 4. Compressor change outs for reliability & capacity.  
 Workpaper Group: 00305F - Compressor change outs for reliability & capacity. VENTURA STATION

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	131	834
Non-Labor	Zero-Based	0	0	0	0	0	0	4,387	28,021
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,518</b>	<b>28,855</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	1.3	8.2

**Business Purpose:**

Increase the compressor engine horsepower from the currently available 3,300 HP to 15,000 HP to meet Goleta Storage field requirements in future years.

**Physical Description:**

- Add 11,700 horsepower to plant
- Upgrade main unit engine instrumentation and controls programming to improve combustion, engine performance over varying loads, and increased start-up reliability.
- Install remote monitoring capability of Ventura Station to Wheeler Ridge Station to provide information and data relative to operations, and engine/compressor health to station maintenance personnel normally stationed at Wheeler.
- Replace belt drive pumps with gear or electric drive
- Replace check valve type Pre-combustion chambers with Electronic Injection (ePCC) controlled Pre-Combustion chambers

**Project Justification:**

The existing 3,300 horsepower station has been utilized to provide increased "suction" pressure to the Goleta Storage Field and has been operated mainly based on gas injection activity at Goleta. Future utilization of this station to meet summer injection capacity at Goleta and to meet the summer load requirements on the coastal system are impacted by a reduction in producer gas from the POPCO site. Meeting these needs will require 15,000 horsepower at the Ventura Station. SCG's Energy Markets and Capacity Products departments recommend that this capacity be added as soon as possible.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 4. Compressor change outs for reliability & capacity.  
Workpaper Group: 00305F - Compressor change outs for reliability & capacity. VENTURA STATION

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor. Such costs are estimated through consultation of recent compressor station projects of similar scope, equipment type and construction environment and augmented by equipment provider quotes.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305F**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 4. Compressor change outs for reliability & capacity.  
 Workpaper Group: 00305F - Compressor change outs for reliability & capacity. VENTURA STATION  
 Workpaper Detail: 00305F.001 - Compressor change outs for reliability & capacity. VENTURA STATION  
 In-Service Date: 11/30/2016  
 Description:

Gas Transmission - Compressor Stations

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		0	131	834
Non-Labor		0	4,387	28,021
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>4,518</b>	<b>28,855</b>
FTE		0.0	1.3	8.2

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00305G - Compressor change outs for reliability & capacity - BLYTHE**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 5. Compressor change outs for reliability & capacity  
 Workpaper Group: 00305G - Compressor change outs for reliability & capacity - BLYTHE

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	73	943
Non-Labor	Zero-Based	0	0	0	0	0	0	2,437	31,687
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,510</b>	<b>32,630</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.7	9.3

**Business Purpose:**

The Blythe Compressor Station is one of SCG's oldest and is the largest receipt-point compression facility. It currently has five poorly performing compressor engines which severely limit reliability and capacity. This project is a conservative attempt to restore capacity that is far short of replacing all eight 60+ years-old compressor engines, pads, piping supports and associated controls.

**Physical Description:**

- Replace three of the eight Clark HBA slow-speed reciprocating engines with new slow-speed engines.
- Replace the two Caterpillar high-speed engines with new slow-speed engines.
- Replace Generator 5 with new unit identical to the existing Caterpillar Generator units.
- Replace Station above-ground piping supports and support systems
- Replace hot well with surge tank for engine water jacket
- Install new lubricating systems
- Replace transite pipe throughout station
- Install enhanced sensor vibration/impact monitoring systems for enhanced engine/compressor shutdown due to abnormal conditions

**Project Justification:**

The most critical issue at Blythe is the engine/compressor foundations' movement at the high-speed Caterpillar units. This movement and settling has caused piping stresses and alignment problems with the compressors, engines, frames, and auxiliary equipment. It also is causing the exhaust stack and silencers to lean several degrees and to show signs of "crushing". This may pose a safety issue if not rectified along with the other problems. The other or many issues is related to the Clark engines having been equipped with a variety of piston rider bands. They need to be standardized with a common modern design using industry-standard rider bands. This to occur while the compressor cylinders and liners are repaired and refurbished as appropriate.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 5. Compressor change outs for reliability & capacity  
Workpaper Group: 00305G - Compressor change outs for reliability & capacity - BLYTHE

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor. Such costs are estimated through consultation of recent compressor station projects of similar scope, equipment type and construction environment and augmented by equipment provider quotes.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305G**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 5. Compressor change outs for reliability & capacity  
 Workpaper Group: 00305G - Compressor change outs for reliability & capacity - BLYTHE  
 Workpaper Detail: 00305G.001 - Compressor change outs for reliability & capacity - BLYTHE  
 In-Service Date: 10/31/2016  
 Description:

Gas Transmission - Compressor Stations

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	73	943
Non-Labor		0	2,437	31,687
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>2,510</b>	<b>32,630</b>
FTE		0.0	0.7	9.3

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00305H - Compressor change outs for reliability & capacity - N & S NEEDLES**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 6. Compressor change outs for reliability & capacity  
 Workpaper Group: 00305H - Compressor change outs for reliability & capacity - N & S NEEDLES

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	0	107	107
Non-Labor	Zero-Based	0	0	0	0	0	0	1,836	1,836
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,943</b>	<b>1,943</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	1.1	1.1

**Business Purpose:**

This Project includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system and covers needed replacements and upgrades at both the North and South Needles compressor stations. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to sustain the reliability and safety of the facility. To keep operating costs down, reliance is made on automating data gathering systems to monitor performance data such as flows, pressures, and temperatures.

**Physical Description:**

At the North Needles Station:  
 - Install a new electrical power generator and convert the two older existing units to standby.  
 - Replace the aging air compressor in order to provide reliable, adequate, start-up air pressure  
 - Upgrade the control panels for the two Caterpillar high-speed compressors to increase efficiency and reliability  
 - Modify the crankcase doors on the three existing Ingersoll-Rand units to control oil leakage  
 - Install electronic port fuel injection on the three Ingersoll-Rand units to increase fuel efficiency and lessen emissions.

At the South Needles Station:  
 - Replace 11 mile steel water line to plant installed in 1957  
 - Replace the Trabon lubricating system installed in the 1990's and in need of replacement or upgrade  
 - Replace the leaky and high-maintenance right-angle gearboxes with a belt and pulley system.  
 - Install higher capacity intercoolers between the turbochargers and engines  
 - Install Rod Drop and Impact Sensors to provide critical early failure warning and maintenance notification  
 - Install Rider Bands on compressor pistons to improve expected time-between-overhaul (TBO) and reliability  
 - Resurface and level the engine blocks of the remaining six legacy units not having this successful upgrade to improve equipment life and maintenance requirements.

**Project Justification:**

North Needles is strategically important as it is the single receipt point for the 34 inch Transwestern pipeline. It has been in service since 1965. Although no new capacity is planned for N. Needles at this time, there is critical need for a new power generator, a new air compressor and the other capital maintenance items listed above.

South Needles is also a major receipt point on the California-Arizona border that has been in service since 1957. It also needs no additional capacity but is in critical need of capital maintenance as listed above in order to keep this aging asset operating reliably and efficiently.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 6. Compressor change outs for reliability & capacity  
Workpaper Group: 00305H - Compressor change outs for reliability & capacity - N & S NEEDLES

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor. Such costs are estimated through consultation of recent compressor station projects of similar scope, equipment type and construction environment and augmented by equipment provider quotes.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305H**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 6. Compressor change outs for reliability & capacity  
 Workpaper Group: 00305H - Compressor change outs for reliability & capacity - N & S NEEDLES  
 Workpaper Detail: 00305H.001 - Compressor change outs for reliability & capacity - NEEDLES  
 In-Service Date: 03/31/2016  
 Description:

Gas Transmission - Compressor Stations

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	107	107
Non-Labor		0	1,836	1,836
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>1,943</b>	<b>1,943</b>
FTE		0.0	1.1	1.1

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**003051 - Compressor change outs for Reliability & capacity - KELSO**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 7. Compressor change outs for Reliability & capacity  
 Workpaper Group: 00305I - Compressor change outs for Reliability & capacity - KELSO

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	187	0
Non-Labor	Zero-Based	0	0	0	0	0	0	3,239	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,426</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	1.9	0.0

**Business Purpose:**

This Budget Code includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to sustain the reliability and safety of the facility. To keep operating costs down, reliance is made on automating data gathering systems to monitor performance data such as flows, pressures, and temperatures. Kelso Station boosts compression received from the North Needles station and sends gas towards the downstream Newberry Springs and Adelanto Stations. No horsepower increases are currently planned at Kelso but two vital capital maintenance issues need to be addressed.

**Physical Description:**

- Replace the leaking Clark Centrifugal compressor wet seal with a mechanical dry seal system.
- Replace the turbine recuperator/regenerator lower tube sheet, which has been weld-repaired several times, with a new side-mount design.

**Project Justification:**

The Clark centrifugal compressor wet seal leaks gas to the atmosphere which, despite the remote location of the Kelso Station, creates a methane emissions issue that needs to be remediated. The Recuperator/generator has not only been weld repaired several times due to cracking, but tubes in the recuperator have been plugged due to the tube sheet cracks. Thermal efficiency of the recuperator has been compromised. Additional repairs may not be possible. Replacing it with a side mount design would allow easier stack access for emissions testing but more importantly would improve safety and access to the hot section of the turbine for maintenance.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 7. Compressor change outs for Reliability & capacity  
Workpaper Group: 00305I - Compressor change outs for Reliability & capacity - KELSO

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor. Such costs are estimated through consultation of recent compressor station projects of similar scope, equipment type and construction environment and augmented by equipment provider quotes.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305I**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 7. Compressor change outs for Reliability & capacity  
 Workpaper Group: 00305I - Compressor change outs for Reliability & capacity - KELSO  
 Workpaper Detail: 00305I.001 - Compressor change outs for Reliability & capacity - KELSO  
 In-Service Date: 07/31/2015  
 Description:

Gas Transmission - Compressor Stations

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	187	0
Non-Labor		0	3,239	0
NSE		0	0	0
	<b>Total</b>	<b>0</b>	<b>3,426</b>	<b>0</b>
FTE		0.0	1.9	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00305J - Multiple M&R projects for Controls & Upgrades - Blanket**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 8. Multiple M&R projects for Controls & Upgrades  
 Workpaper Group: 00305J - Multiple M&R projects for Controls & Upgrades - Blanket

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	11	11	11
Non-Labor	Zero-Based	0	0	0	0	0	191	191	191
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>202</b>	<b>202</b>	<b>202</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

**Business Purpose:**

This Budget Code includes costs associated with the installation and replacement of compressor station equipment used in operating the transmission system. The nature of compressor station operation requires consistent maintenance and replacement of key engine components and controls equipment to sustain the reliability and safety of the facility. To keep operating costs down, reliance is made on automating data gathering systems to monitor performance data such as flows, pressures, and temperatures. The upgrade and replacement of controls consisting of out dated technology is critical to enable the station to operate at its highest efficiency and that proper testing and diagnostics can be executed when the engine units are down.

**Physical Description:**

Individual project scopes can consist of one or a combination of the following installations: replacing the pneumatic and electro-mechanical control systems and related station auxiliary systems, installation of new engine control panels, new station control panel and replacement of sensors, wiring, industrial communications and local controllers, new Programmable Logic Controllers, local control networks, operator interfaces, continuous emissions monitoring (CEMS), pre combustion chambers, and new catalysts. This work paper represents multiple smaller projects not qualifying for their own work paper and is based on recent experience in maintaining compressor-related equipment through capital component replacements and upgrades.

**Project Justification:**

Compressor engine components have a finite life requiring regular replacement and/or upgrade as recommended by the manufacturer to sustain reliability and transportation ability for the Southern California market. For older stations where existing control and auxiliary equipment technology are outdated, replacements are required to interface with newer data acquisition systems and air quality mandated emission system upgrades.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00305.0  
Category: F. Compressor Stations (BC 3X5)  
Category-Sub: 8. Multiple M&R projects for Controls & Upgrades  
Workpaper Group: 00305J - Multiple M&R projects for Controls & Upgrades - Blanket

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment and contract labor. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, equipment type and construction environment.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00305J**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00305.0  
 Category: F. Compressor Stations (BC 3X5)  
 Category-Sub: 8. Multiple M&R projects for Controls & Upgrades  
 Workpaper Group: 00305J - Multiple M&R projects for Controls & Upgrades - Blanket  
 Workpaper Detail: 00305J.001 - Blanket - Multiple M&R projects for Controls & Upgrades  
 In-Service Date: Not Applicable

Description:

Gas Transmission - Compressor Stations
--

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		11	11	11
Non-Labor		191	191	191
NSE		0	0	0
	<b>Total</b>	<b>202</b>	<b>202</b>	<b>202</b>
FTE		0.1	0.1	0.1

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: G. Cathodic Protection (BC 316)  
Workpaper: 003160

**Summary for Category: G. Cathodic Protection (BC 316)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	151	170	1,284	1,284
Non-Labor	955	1,162	7,702	7,702
NSE	0	0	0	0
<b>Total</b>	<b>1,106</b>	<b>1,332</b>	<b>8,986</b>	<b>8,986</b>
FTE	1.6	1.7	13.0	13.0

**003160 GT Cathodic Protection / Externally Driven**

Labor	151	170	1,284	1,284
Non-Labor	955	1,162	7,702	7,702
NSE	0	0	0	0
<b>Total</b>	<b>1,106</b>	<b>1,332</b>	<b>8,986</b>	<b>8,986</b>
FTE	1.6	1.7	13.0	13.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**003160 - GT Cathodic Protection / Externally Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00316.0  
 Category: G. Cathodic Protection (BC 316)  
 Category-Sub: 1. GT Cathodic Protection / Externally Driven  
 Workpaper Group: 003160 - GT Cathodic Protection / Externally Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	157	272	214	57	151	170	1,284	1,284
Non-Labor	Zero-Based	868	2,092	1,688	199	955	1,162	7,702	7,702
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1,025</b>	<b>2,363</b>	<b>1,902</b>	<b>256</b>	<b>1,106</b>	<b>1,332</b>	<b>8,986</b>	<b>8,986</b>
FTE	Zero-Based	1.5	2.7	2.2	0.6	1.6	1.7	13.0	13.0

**Business Purpose:**

This Budget Code includes costs associated with the installation of cathodic protection equipment used to preserve the integrity of transmission pipelines by protecting them from external corrosion. These projects are mandated by federal and state minimum pipeline safety regulations, and enable the maintenance of adequate cathodic protection on company facilities.

Costs recorded and estimated in budget categories 306 and 316 are included in this submission.

**Physical Description:**

Typical expenditures include the replacement of surface anode beds, deep well anodes and/or rectifier systems, installation of new cathodic protection stations, and applying cathodic protection to existing steel mains and service lines. Cathodic protection projects may also include the installation of new remote satellite communication technology which allows for more efficient operation and monitoring of the cathodic protection system. In addition to the estimated amount based on a 5-year average of recorded costs, an incremental amount of \$7.7M has been added to 2015 and 2016. This is to fund needed capital repairs of pipelines with poor or disbanded coating which prevents cathodic protection from preventing rusting and pitting over the entire exposed wall of the pipeline. To correct these conditions, in many cases, the pipeline will be exposed for application of new coating but if found in bad enough condition, the entire pipe would be replaced on the spot.

**Project Justification:**

Application of cathodic protection provides greater system protection against corrosion. It allows SoCalGas to meet Federal and State safety compliance requirements to sustain reliability of transportation into the Southern California market. The incremental amount mentioned above is to remediate inadequate and localized exposure of Transmission pipelines with poor coating to rust, pitting, and eventual failure.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00316.0  
Category: G. Cathodic Protection (BC 316)  
Category-Sub: 1. GT Cathodic Protection / Externally Driven  
Workpaper Group: 003160 - GT Cathodic Protection / Externally Driven

**Forecast Methodology:**

**Labor - Zero-Based**

5-yr average used for 2014 due to a wide level of annual spending during the 2009-2013 period. 2015 and 2016 are 5-yr average plus incremental amount of approx. \$7.7M for special program of repairing or replacing poorly wrapped transmission main as noted above.

**Non-Labor - Zero-Based**

5-yr average used for 2014 due to a wide level of annual spending during the 2009-2013 period. 2015 and 2016 are 5-yr average plus incremental amount of approx. \$7.7M for special program of repairing or replacing poorly wrapped transmission main as noted above.

**NSE - Zero-Based**

None. This work is pipeline-related.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00316.0  
 Category: G. Cathodic Protection (BC 316)  
 Category-Sub: 1. GT Cathodic Protection / Externally Driven  
 Workpaper Group: 003160 - GT Cathodic Protection / Externally Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	Zero-Based	170	1,284	1,284	0	0	0	170	1,284	1,284
Non-Labor	Zero-Based	1,162	7,702	7,702	0	0	0	1,162	7,702	7,702
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1,332</b>	<b>8,986</b>	<b>8,986</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,332</b>	<b>8,986</b>	<b>8,986</b>
FTE	Zero-Based	1.7	13.0	13.0	0.0	0.0	0.0	1.7	13.0	13.0

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00316.0  
Category: G. Cathodic Protection (BC 316)  
Category-Sub: 1. GT Cathodic Protection / Externally Driven  
Workpaper Group: 003160 - GT Cathodic Protection / Externally Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	108	197	171	49	129
Non-Labor	707	1,776	1,569	200	955
NSE	0	0	0	0	0
<b>Total</b>	<b>815</b>	<b>1,973</b>	<b>1,739</b>	<b>249</b>	<b>1,085</b>
FTE	1.3	2.3	1.9	0.5	1.4
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	108	197	171	49	129
Non-Labor	707	1,776	1,569	200	955
NSE	0	0	0	0	0
<b>Total</b>	<b>815</b>	<b>1,973</b>	<b>1,739</b>	<b>249</b>	<b>1,085</b>
FTE	1.3	2.3	1.9	0.5	1.4
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	20	34	28	8	21
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>20</b>	<b>34</b>	<b>28</b>	<b>8</b>	<b>21</b>
FTE	0.2	0.4	0.3	0.1	0.2
<b>Escalation to 2013\$</b>					
Labor	29	41	15	0	0
Non-Labor	161	315	119	-1	0
NSE	0	0	0	0	0
<b>Total</b>	<b>190</b>	<b>356</b>	<b>134</b>	<b>-1</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	157	272	214	57	151
Non-Labor	868	2,092	1,688	199	955
NSE	0	0	0	0	0
<b>Total</b>	<b>1,025</b>	<b>2,363</b>	<b>1,902</b>	<b>256</b>	<b>1,106</b>
FTE	1.5	2.7	2.2	0.6	1.6

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00316.0  
 Category: G. Cathodic Protection (BC 316)  
 Category-Sub: 1. GT Cathodic Protection / Externally Driven  
 Workpaper Group: 003160 - GT Cathodic Protection / Externally Driven

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	0	0	0
Non-Labor		0	0	0	0	0
NSE		0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 003160**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00316.0  
 Category: G. Cathodic Protection (BC 316)  
 Category-Sub: 1. GT Cathodic Protection / Externally Driven  
 Workpaper Group: 003160 - GT Cathodic Protection / Externally Driven  
 Workpaper Detail: 003160.001 - Gas Transmission Cathodic Protection Capital. Mostly Anode beds and Rectifiers.  
 In-Service Date: Not Applicable

Description:

Gas Transmission - Cathodic Protection
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<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u><b>2014</b></u>	<u><b>2015</b></u>	<u><b>2016</b></u>
Labor		170	1,284	1,284
Non-Labor		1,162	7,702	7,702
NSE		0	0	0
	<b>Total</b>	<u><b>1,332</b></u>	<u><b>8,986</b></u>	<u><b>8,986</b></u>
FTE		1.7	13.0	13.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: H. M&R Stations (BC 3X8)  
Workpaper: VARIOUS

**Summary for Category: H. M&R Stations (BC 3X8)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	1,323	1,559	1,543
Non-Labor	0	6,668	7,864	7,778
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>7,991</b>	<b>9,423</b>	<b>9,321</b>
FTE	0.0	13.1	15.5	15.3

**00308A Kettleman Station Valve replacement**

Labor	0	255	0	0
Non-Labor	0	1,288	0	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,543</b>	<b>0</b>	<b>0</b>
FTE	0.0	2.5	0.0	0.0

**00308B Valves for Class Location compliance - Aging infrastructure**

Labor	0	593	1,018	1,187
Non-Labor	0	2,989	5,131	5,984
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>3,582</b>	<b>6,149</b>	<b>7,171</b>
FTE	0.0	5.9	10.1	11.8

**00308C M&R Operations - Major Customer MSA Rebuilds; BTU District GC & ancillaries - Non coll**

Labor	0	475	541	356
Non-Labor	0	2,391	2,733	1,794
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>2,866</b>	<b>3,274</b>	<b>2,150</b>
FTE	0.0	4.7	5.4	3.5

Note: Totals may include rounding differences.

**Beginning of Workpaper Group**  
**00308A - Kettleman Station Valve replacement**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00308.0  
 Category: H. M&R Stations (BC 3X8)  
 Category-Sub: 1. Kettleman Station Valve replacement  
 Workpaper Group: 00308A - Kettleman Station Valve replacement

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	255	0	0
Non-Labor	Zero-Based	0	0	0	0	0	1,288	0	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,543</b>	<b>0</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0

**Business Purpose:**

This Budget Code includes costs of installing and rebuilding large meter set assemblies (MSAs) for transmission-served customers and pressure limiting stations residing on the gas transmission system. These assets require replacement for three principal reasons: aging, change in use patterns and/or population encroachment, and enhancement of the transmission system to contend with gas quality and capacity issues. The capital work sustains reliable operation of critical transmission assets to the extent that they are not compromised by equipment deployed past its useful life. This includes periodic replacement of local field measurement and control equipment directly linking with Gas Operations SCADA system via remote communications.

**Physical Description:**

Replace existing plug valve at Kettleman Measuring station 89 on Line 800. Install full-opening ball valve with remote actuator. Also adds flow meter.

**Project Justification:**

Installation of full-opening ball valve off Line 7043 provides for added capacity in downstream Line 800 which feeds several Distribution Supply lines in need of reinforcement due to customer growth. Provides flow/pressure monitoring and remote control of this tap valve in the event of a downstream break. The ability by Gas Control to close this valve in the event of an emergency protects capacity in upstream Line 7043 and the feed originating in backbone Line 85.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00308.0  
Category: H. M&R Stations (BC 3X8)  
Category-Sub: 1. Kettleman Station Valve replacement  
Workpaper Group: 00308A - Kettleman Station Valve replacement

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These projects are for Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00308A**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00308.0  
 Category: H. M&R Stations (BC 3X8)  
 Category-Sub: 1. Kettleman Station Valve replacement  
 Workpaper Group: 00308A - Kettleman Station Valve replacement  
 Workpaper Detail: 00308A.001 - Gas Transmission - M&R Stations - Kettleman Valve replacements - Install flow meter and  
 In-Service Date: 06/30/2014  
 Description:

Gas Transmission - M&R Stations - Additions & Replacements
--

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		255	0	0
Non-Labor		1,288	0	0
NSE		0	0	0
	<b>Total</b>	<b>1,543</b>	<b>0</b>	<b>0</b>
FTE		2.5	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00308B - Valves for Class Location compliance - Aging infrastructure**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00308.0  
 Category: H. M&R Stations (BC 3X8)  
 Category-Sub: 2. Valves for Class Location compliance - Aging infra  
 Workpaper Group: 00308B - Valves for Class Location compliance - Aging infrastructure

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	593	1,018	1,187
Non-Labor	Zero-Based	0	0	0	0	0	2,989	5,131	5,984
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,582</b>	<b>6,149</b>	<b>7,171</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	5.9	10.1	11.8

**Business Purpose:**

This Budget Code includes costs of installing and rebuilding large meter set assemblies (MSAs) for transmission-served customers and pressure limiting stations residing on the gas transmission system. These assets require replacement for three principal reasons: aging, change in use patterns and/or population encroachment, and enhancement of the transmission system to contend with gas quality and capacity issues. The capital work sustains reliable operation of critical transmission assets to the extent that they are not compromised by equipment deployed past its useful life. This includes periodic replacement of local field measurement and control equipment directly linking with Gas Operations SCADA system via remote communications.

**Physical Description:**

Typical expenditures includes the instrumentation necessary for the metering or regulating of natural gas in connection with transmission operations and, in particular, costs associated with additions or replacements of station piping, valves, regulators, control and communications equipment, shelters and enclosures. This project includes adding and/or replacing critical valves in large pressure regulating stations to comply with federal class location regulations. Also included are local projects to replace or upgrade customer metering sites and large pressure regulating equipment due to age and/or obsolescence.

**Project Justification:**

Requested funding includes installation of new meter and regulation equipment associated with operation of the transmission pipeline system. It includes gas meters installed to help manage gas flows and quality on the transmission system, and to provide operating information to gas operations control personnel remotely managing the gas delivery system. Also included in this category are regulating stations used to control and limit gas pressure and the flow of gas within the gas transmission system, such as city gate stations. The installation of this equipment is associated with the safe and reliable local operation of SoCalGas pipelines in conformance with DOT and CPUC requirements for the limiting of pipeline and vessel operating pressures. All pipelines must be operated within their maximum allowable operating pressure parameters, and this equipment, whether for newly-installed pipelines or, where replacement is warranted, maintains this compliance and operating integrity.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00308.0  
Category: H. M&R Stations (BC 3X8)  
Category-Sub: 2. Valves for Class Location compliance - Aging infra  
Workpaper Group: 00308B - Valves for Class Location compliance - Aging infrastructure

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Non-labor costs are typically for materials, construction equipment, contract labor and paving repair. Such costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects of similar scope, pipe size and construction environment.

**NSE - Zero-Based**

None. These projects are related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00308B**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00308.0  
 Category: H. M&R Stations (BC 3X8)  
 Category-Sub: 2. Valves for Class Location compliance - Aging infra  
 Workpaper Group: 00308B - Valves for Class Location compliance - Aging infrastructure  
 Workpaper Detail: 00308B.001 - Valves for Class Location compliance - Aging infrastructure  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - M&R Stations - Additions & Replacements

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		593	1,018	1,187
Non-Labor		2,989	5,131	5,984
NSE		0	0	0
	<b>Total</b>	<b>3,582</b>	<b>6,149</b>	<b>7,171</b>
FTE		5.9	10.1	11.8

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00308C - M&R Operations - Major Customer MSA Rebuilds; BTU District GC &**  
**ancillaries - Non collectible**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00308.0  
 Category: H. M&R Stations (BC 3X8)  
 Category-Sub: 3. M&R Operations - Major Customer MSA Rebuilds; BTU  
 Workpaper Group: 00308C - M&R Operations - Major Customer MSA Rebuilds; BTU District GC & ancillaries - Non collectible

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	475	541	356
Non-Labor	Zero-Based	0	0	0	0	0	2,391	2,733	1,794
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,866</b>	<b>3,274</b>	<b>2,150</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	4.7	5.4	3.5

**Business Purpose:**

This Budget Code is for the installation (new, rebuild and upgrade) of gas metering and regulator stations associated with gas transmission pipeline operation and customers served from those pipelines. The assets include base mechanical and electronic metering systems, pressure regulating and valve stations used in conjunction with volume measurement and gas quality measurement facilities use to compute heating values applied to 6 million customers; and to track gas quality for regulatory reporting.

**Physical Description:**

For this GRC period, the work includes the rebuild of one large customer metering facility per year (at ~\$2 MM) and the upgrade and/or new installation of transmission pipeline Btu metering stations per year. Customer metering infrastructure projects are associated with two principal drivers, the age of existing equipment (typically 35-50 years old) and changes to the operating profile of many Electric Generating plants located in the LA basin due to "repowering" activity. Customer's have changed equipment and associated load profiles for service. In most instances peak load has been reduced while load range and transient operational requirements have or will increase. The target facilities to be rebuilt include Scattergood Electrical Generating Plant (to be completed Q1, 2014), and one other large facility in each of years 2014, 2015 and 2016.

**Project Justification:**

Many of these large MSA sites have been in service for decades and are approaching or are past their expected service lives. These replacements are critical in continuing to provide safe, reliable and accurate measurement and pressure regulation to these large industrial customers. BTU measurement of natural gas in the system is vital to accurate billing of every customer of SoCalGas and these sites deserve the most accurate and reliable measuring equipment available to meet mandated requirements and customers' expectations.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00308.0  
Category: H. M&R Stations (BC 3X8)  
Category-Sub: 3. M&R Operations - Major Customer MSA Rebuilds; BTU  
Workpaper Group: 00308C - M&R Operations - Major Customer MSA Rebuilds; BTU District GC & ancillaries - Non collectible

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

Based on recent completed work, the cost for these facility installations exceeds \$2 million per site. Costs here are for installation and upgrade of 2-4 sites annually, to measure/track gas quality with on-line gas chromatographs; and to accurately calculate heating value for customers in SoCalGas "btu (heating) districts," are also contained in this BC and funding request category. The need for this work is driven by changing operational flow requirements and conditions on SoCalGas transmission pipeline system which drives the need for additional or relocation of existing gas heating value measurement facilities, in order for SoCalGas to fully comply with General order 58 A and B prescription for customer billing accuracy.

**NSE - Zero-Based**

None. These costs are related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00308C**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00308.0  
 Category: H. M&R Stations (BC 3X8)  
 Category-Sub: 3. M&R Operations - Major Customer MSA Rebuilds; BTU  
 Workpaper Group: 00308C - M&R Operations - Major Customer MSA Rebuilds; BTU District GC & anciliaries - Non collectib  
 Workpaper Detail: 00308C.001 - M&R Operations - Maajor Customer MSA Rebuilds; BTU District GC & anciliaries - Non coll  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - M&R Stations - Additions & Replacements

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		475	541	356
Non-Labor		2,391	2,733	1,794
NSE		0	0	0
	<b>Total</b>	<b>2,866</b>	<b>3,274</b>	<b>2,150</b>
FTE		4.7	5.4	3.5

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: I. Auxiliary Equipment (BC 3X9)  
Workpaper: VARIOUS

**Summary for Category: I. Auxiliary Equipment (BC 3X9)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	909	1,517	909
Non-Labor	0	3,902	3,902	3,902
NSE	0	2,068	4,137	2,068
<b>Total</b>	<b>0</b>	<b>6,879</b>	<b>9,556</b>	<b>6,879</b>
FTE	0.0	8.4	13.7	8.4

**00309A Transmission Operations - Pipeline Span Supports**

Labor	0	105	0	0
Non-Labor	0	1,169	0	0
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,274</b>	<b>0</b>	<b>0</b>
FTE	0.0	1.1	0.0	0.0

**00309B Communications Replacement for key Remote Telemetry Unit (RTU)**

Labor	0	0	67	67
Non-Labor	0	0	742	742
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>809</b>	<b>809</b>
FTE	0.0	0.0	0.7	0.7

**00309C Aux Equipment - Blanket Projects**

Labor	0	196	234	234
Non-Labor	0	2,733	3,160	3,160
NSE	0	0	0	0
<b>Total</b>	<b>0</b>	<b>2,929</b>	<b>3,394</b>	<b>3,394</b>
FTE	0.0	2.0	2.4	2.4

**00309D High Pressure Data Synchronization**

Labor	0	608	1,216	608
Non-Labor	0	0	0	0
NSE	0	2,068	4,137	2,068
<b>Total</b>	<b>0</b>	<b>2,676</b>	<b>5,353</b>	<b>2,676</b>
FTE	0.0	5.3	10.6	5.3

Note: Totals may include rounding differences.

**Beginning of Workpaper Group**  
**00309A - Transmission Operations - Pipeline Span Supports**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 1. Transmission Operations - Pipeline Span Supports  
 Workpaper Group: 00309A - Transmission Operations - Pipeline Span Supports

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	105	0	0
Non-Labor	Zero-Based	0	0	0	0	0	1,169	0	0
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,274</b>	<b>0</b>	<b>0</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0

**Business Purpose:**

Requested funding in this category includes new installations or upgrades of aging M&R station and pipeline system control and telemetry systems which link with and provide information to, but are not a direct part of SoCalGas centralized SCADA computer system. Assets which reside on the upstream side of the remote communications network to SoCalGas central SCADA system are defined and requested under plant category 309/319. SoCalGas has over pipeline 200 locations where local controls interface with its operations control center/central SCADA system. SoCalGas installs and/or modifies 10-20 such facilities in a typical year.

**Physical Description:**

Install new Transmission Pipeline supports on existing spans in Lines 247, 159, and 128 in the Goleta storage field (Transmission pipelines). Replace span in Line 103 across the Buena Vista canal adjacent to Tupman Rd. near Buttonwillow. Includes permitting, engineering design, soil testing and analysis, plus fabrication and installation. Remove old structures.

**Project Justification:**

Existing spans are old and no longer provide the required support for these critical pipelines. To not perform this work would expose these lines to out-of-tolerance stress and ultimate failure.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00309.0  
Category: I. Auxiliary Equipment (BC 3X9)  
Category-Sub: 1. Transmission Operations - Pipeline Span Supports  
Workpaper Group: 00309A - Transmission Operations - Pipeline Span Supports

**Forecast Methodology:**

**Labor - Zero-Based**

Labor content is based on the most recent five years' experience in this overall BC.

**Non-Labor - Zero-Based**

Costs are estimated by experienced pipeline construction management personnel using reference to recent pipeline construction projects involving spans of similar scope, pipe size and length, and construction environment.

**NSE - Zero-Based**

None. These are related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00309A**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 1. Transmission Operations - Pipeline Span Supports  
 Workpaper Group: 00309A - Transmission Operations - Pipeline Span Supports  
 Workpaper Detail: 00309A.001 - Transmission Operations - Piping Support replacements Buttonwillow & La Goleta  
 In-Service Date: 09/30/2014  
 Description:

Gas Transmission - Aux Equipment

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		105	0	0
Non-Labor		1,169	0	0
NSE		0	0	0
	<b>Total</b>	<b>1,274</b>	<b>0</b>	<b>0</b>
FTE		1.1	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00309B - Communications Replacement for key Remote Telemetry Unit (RTU)**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: 1. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 2. Communications Replacement for critical Remote Tel  
 Workpaper Group: 00309B - Communications Replacement for key Remote Telemetry Unit (RTU)

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	0	67	67
Non-Labor	Zero-Based	0	0	0	0	0	0	742	742
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>809</b>	<b>809</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7

**Business Purpose:**

Estimated funding in this category includes new installations or upgrades of aging M&R station and pipeline system control and telemetry systems which link with and provide information to, but are not a direct part of SoCalGas centralized SCADA computer system. Assets which reside on the upstream side of the remote communications network to SoCalGas central SCADA system are defined and requested under plant category 309/319. SoCalGas has over 200 pipeline locations where local controls interface with its operations control center/central SCADA system. SoCalGas installs, replaces and/or upgrades 10-20 such facilities in a typical year.

**Physical Description:**

Included are local controls and communication devices such as programmable logic controllers (PLCs), pressure transmitters, Uninterruptable Power Supply (UPS) systems, temperature probes, gas quality remote sensors, and communication interfaces/technologies. This equipment is used to control the flow of gas in pipelines, valves and regulator stations both locally and through the initiation of remote commands from central SCADA system. This project is to replace and/or upgrade communications equipment at approximately 15 to 20 remote telemetry sites (RTU) during 2015 and 2016.

**Project Justification:**

This capital work sustains reliable operation of key transmission assets to the extent that they are not compromised by equipment deployed past its useful life. These assets require replacement due to aging, change in use patterns, and enhancement of the transmission system to contend with gas quality and capacity issues.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00309.0  
Category: I. Auxiliary Equipment (BC 3X9)  
Category-Sub: 2. Communications Replacement for critical Remote Tel  
Workpaper Group: 00309B - Communications Replacement for key Remote Telemetry Unit (RTU)

**Forecast Methodology:**

**Labor - Zero-Based**

The labor portion of total direct project costs is derived as a percentage of costs in this BC over the last five recorded years.

**Non-Labor - Zero-Based**

This estimate is based on between 15 and 20 site telemetry systems replacements and/or upgrades done during 2015 and 2016 at approximately \$46K per site.

**NSE - Zero-Based**

None. This project is related to Gas Transmission capital assets.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00309B**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 2. Communications Replacement for critical Remote Tel  
 Workpaper Group: 00309B - Communications Replacement for key Remote Telemetry Unit (RTU)  
 Workpaper Detail: 00309B.001 - Communications Replacement for critical RTU.

In-Service Date: Not Applicable

Description:

Gas Transmission - Aux equipment.
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<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u><b>2014</b></u>	<u><b>2015</b></u>	<u><b>2016</b></u>
Labor		0	67	67
Non-Labor		0	742	742
NSE		0	0	0
	<b>Total</b>	<u><b>0</b></u>	<u><b>809</b></u>	<u><b>809</b></u>
FTE		0.0	0.7	0.7

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00309C - Aux Equipment - Blanket Projects**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 3. GT-Aux\_Equipment Blanket Projects  
 Workpaper Group: 00309C - Aux Equipment - Blanket Projects

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
	<b>Years</b>								
Labor	Zero-Based	0	0	0	0	0	196	234	234
Non-Labor	Zero-Based	0	0	0	0	0	2,733	3,160	3,160
NSE	Zero-Based	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,929</b>	<b>3,394</b>	<b>3,394</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	2.0	2.4	2.4

**Business Purpose:**

Estimated costs in this category includes new installations or upgrades of aging M&R station and pipeline system control and telemetry systems which link with and provide information to, but are not a direct part of SoCalGas centralized SCADA computer system. Assets which reside on the upstream side of the remote communications network to SoCalGas central SCADA system are defined and requested under plant category 309/319. SoCalGas has over pipeline 200 locations where local controls interface with its operations control center/central SCADA system. SoCalGas installs and/or modifies 10-20 such facilities in a typical year.

**Physical Description:**

Included are local controls and communication devices such as programmable logic controllers (PLCs), pressure transmitters, UPS systems, temperature probes, gas quality remote sensors, and communication interfaces/technologies. This equipment is used to control the flow of gas in pipelines, valves and regulator stations both locally and through the initiation of remote commands from central SCADA system.

**Project Justification:**

This capital work sustains reliable operation of critical transmission assets to the extent that they are not compromised by equipment deployed past its useful life. These assets require replacement due to aging, change in use patterns, and enhancement of the transmission system to contend with gas quality and capacity issues.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00309.0  
Category: I. Auxiliary Equipment (BC 3X9)  
Category-Sub: 3. GT-Aux\_Equipment Blanket Projects  
Workpaper Group: 00309C - Aux Equipment - Blanket Projects

**Forecast Methodology:**

**Labor - Zero-Based**

Labor content is based on the previous 5 years of recorded activity in this BC.

**Non-Labor - Zero-Based**

The estimate for the test year is based on approximately 18 projects at an average cost of \$188,500 per project.

**NSE - Zero-Based**

None. This is Gas Transmission capital equipment.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00309C**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 3. GT-Aux\_Equipment Blanket Projects  
 Workpaper Group: 00309C - Aux Equipment - Blanket Projects  
 Workpaper Detail: 00309C.001 - Aux Equipment - Blanket Projects

In-Service Date: Not Applicable

Description:

Gas Transmission - Aux Equipment

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		196	234	234
Non-Labor		2,733	3,160	3,160
NSE		0	0	0
	<b>Total</b>	<b>2,929</b>	<b>3,394</b>	<b>3,394</b>
FTE		2.0	2.4	2.4

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**00309D - High Pressure Data Synchronization**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 4. High Pressure Data Synchronization  
 Workpaper Group: 00309D - High Pressure Data Synchronization

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
Years									
Labor	Zero-Based	0	0	0	0	0	608	1,216	608
Non-Labor	Zero-Based	0	0	0	0	0	0	0	0
NSE	Zero-Based	0	0	0	0	0	2,068	4,137	2,068
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,676</b>	<b>5,353</b>	<b>2,676</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	5.3	10.6	5.3

**Business Purpose:**

The objective of this project is to enhance SoCalGas and SDG&E's GIS and CAD systems to enable improvements for high pressure data sets and safety management. This includes a new data model, revised data attribution, reconciliation of existing asset data attribution, conversion of selected linear asset data to a geospatial format to support connectivity modeling and enhancements to provide a synchronized view of asset data. Fundamentally there are five high level work streams for this project, mapping of data sets, conversion of linear assets to geospatial data, system of record selection, field verification, and technical enhancements for forward looking data capture. An additional work stream will be focused on policy changes and process improvements. To support these work streams the project team will first define the data model, attribution, & data mapping requirements. Following this work, the project team will select a vendor and contractors to work through the technical enhancements. During the build phase of the technical architecture, the quality control and assurance of the revised data attribution will be validated with field verification of business location (i.e. population density centers) and high consequence areas. This field verification will be a direct input to the overall QA process. During technical enhancement and integration testing data, maintenance and capture processes will be documented and the pertinent resources trained on any changes. Process and policy definition will also occur for the improved risk assessment, analytics, and reporting capabilities. While the project reflects a standard SDLC, data mapping and synchronization process, the field verification component requires additional resources.

**Physical Description:**

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00309.0  
Category: I. Auxiliary Equipment (BC 3X9)  
Category-Sub: 4. High Pressure Data Synchronization  
Workpaper Group: 00309D - High Pressure Data Synchronization

This project will design and implement systems and process enhancements for SoCalGas and SDG&E's GIS and CAD systems. These changes are required to synchronize the different high-pressure pipeline data sets among the various gas operating groups. This includes additional asset data attribution, conversion of linear to geospatial data and improved synchronization of pipeline and storage asset data across GIS and CAD systems to support integrity analysis and modeling.

The high pressure pipe (operating at greater than 60 psig), medium pressure pipe (operating at or below 60 psig), storage field pipe (Division of Oil, Gas, and Geothermal Resources-DOGGR) and other above ground pipeline assets that exist across multiple GIS, CAD databases and software platforms. The utilities need modern tools to more effectively manage their assets, such as a real-world representation of a pipeline location to better assess risk on pipelines. Since our high pressure pipeline assets are operated by transmission, distribution and storage, data often resides in multiple systems with different levels and types of data attribution. For example, both the High Pressure Pipeline Database (HPPD) and the Distribution Supply Line Summaries contain pipeline data for Transmission and Distribution, respectively; however, these two programs do not reside in the same platform making access more cumbersome. Given the regulatory expectations to provide more ready access to our pipeline data, a solution needs to be evaluated and executed to keep the data consistent, improved and reconciled. The solution will also need to include the business processes necessary to support the analytics and reporting capabilities to comply with seemingly ever-changing regulatory requirements. Proposed enhancements and changes will enable improved pipeline network asset management.

**Project Justification:**

This work is required to support pipeline safety and integrity modeling and analytics by the new HPPD system. This capability is critical to pipeline safety and integrity analysis and risk management. This project supports compliance with continually evolving PHMSA standards including title 49 CFR parts 191-193, and other regulatory requirements, such as GO 112-E. To successfully improve upon the high pressure asset management capability and to continue to build on existing risk models and reporting this project is essential. Without this effort, performance based risk management related to high pressure assets may not be possible as the capability continues to evolve.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00309.0  
Category: I. Auxiliary Equipment (BC 3X9)  
Category-Sub: 4. High Pressure Data Synchronization  
Workpaper Group: 00309D - High Pressure Data Synchronization

**Forecast Methodology:**

**Labor - Zero-Based**

Company labor is based on:  
6 FTE's to do data modeling and specify rules for conversion  
8 FTE's to do vendor conversion and perform Quality Assurance (QA)  
8 FTE's to do application and Integration, Process/policy and technical guidance and direction, change management and project management.

**Non-Labor - Zero-Based**

Contract costs are based on:  
6 contract resources to do data modeling and specify rules for conversion  
3 contract resources to do vendor conversion and QA  
14 contract resources and 3 consultants to do application and Integration, support process/policy and technical guidance and direction, change management and project management.

**NSE - Zero-Based**

Non-labor costs should be treated as non-standard due to the fact this is a software/data conversion project.

**Beginning of Workpaper Sub Details for  
Workpaper Group 00309D**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 4. High Pressure Data Synchronization  
 Workpaper Group: 00309D - High Pressure Data Synchronization  
 Workpaper Detail: 00309D.001 - High Pressure Data Synchronization - Phase I - 2014 Costs  
 In-Service Date: 12/31/2014  
 Description:

Gas Transmission - Aux Equipment

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		608	0	0
Non-Labor		0	0	0
NSE		2,068	0	0
	<b>Total</b>	<b>2,676</b>	<b>0</b>	<b>0</b>
FTE		5.3	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 4. High Pressure Data Synchronization  
 Workpaper Group: 00309D - High Pressure Data Synchronization  
 Workpaper Detail: 00309D.002 - High Pressure Data Synchronization - Phase II - 2015 costs  
 In-Service Date: 12/31/2015

Description:

Gas Transmission - Aux Equipment
----------------------------------

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		0	1,216	0
Non-Labor		0	0	0
NSE		0	4,137	0
	<b>Total</b>	<b>0</b>	<b>5,353</b>	<b>0</b>
FTE		0.0	10.6	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00309.0  
 Category: I. Auxiliary Equipment (BC 3X9)  
 Category-Sub: 4. High Pressure Data Synchronization  
 Workpaper Group: 00309D - High Pressure Data Synchronization  
 Workpaper Detail: 00309D.003 - High Pressure Data Synchronization - Phase III - 2016 Costs  
 In-Service Date: 06/30/2016  
 Description:

Gas Transmission - Aux Equipment

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	608
Non-Labor		0	0	0
NSE		0	0	2,068
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>2,676</b>
FTE		0.0	0.0	5.3

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: J. Land Rights (BC 617)  
Workpaper: 006170

**Summary for Category: J. Land Rights (BC 617)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	58	21	21	21
Non-Labor	543	128	128	128
NSE	0	0	0	0
<b>Total</b>	<b>601</b>	<b>149</b>	<b>149</b>	<b>149</b>
FTE	0.7	0.2	0.2	0.2

**006170 GT PL Land Rights / Externally Driven**

Labor	58	21	21	21
Non-Labor	543	128	128	128
NSE	0	0	0	0
<b>Total</b>	<b>601</b>	<b>149</b>	<b>149</b>	<b>149</b>
FTE	0.7	0.2	0.2	0.2

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**006170 - GT PL Land Rights / Externally Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00617.0  
 Category: J. Land Rights (BC 617)  
 Category-Sub: 1. Land Rights  
 Workpaper Group: 006170 - GT PL Land Rights / Externally Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
	<b>Years</b>								
Labor	5-YR Average	0	1	3	42	58	21	21	21
Non-Labor	5-YR Average	0	2	13	83	543	128	128	128
NSE	5-YR Average	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>3</b>	<b>16</b>	<b>125</b>	<b>601</b>	<b>149</b>	<b>149</b>	<b>149</b>
FTE	5-YR Average	0.0	0.0	0.0	0.5	0.7	0.2	0.2	0.2

**Business Purpose:**

This BC provides capital funding for purchases of land or land rights for new Transmission pipelines and for existing rights-of-way that have expired per contractual obligation and need to be re-negotiated. Typically these are for pipelines installed in private lands.

**Physical Description:**

Pipeline rights-of-way physical dimensions vary but may be at least third feet wide (to allow for workers, vehicles and equipment) and are as long as the distance across a property owner's land. They are contractual agreements for which landowners are compensated and may incorporate and expiration date.

**Project Justification:**

Federal law requires public utility lines occupying private lands to be protected by acquisition of land rights thus protecting the utility and their downstream consumers.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00617.0  
Category: J. Land Rights (BC 617)  
Category-Sub: 1. Land Rights  
Workpaper Group: 006170 - GT PL Land Rights / Externally Driven

**Forecast Methodology:**

**Labor - 5-YR Average**

Used 5-yr average in absence of specific identified needs at the time the plan was developed.

**Non-Labor - 5-YR Average**

Used 5-yr average in absence of specific identified needs at the time the plan was developed.

**NSE - 5-YR Average**

None.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00617.0  
 Category: J. Land Rights (BC 617)  
 Category-Sub: 1. Land Rights  
 Workpaper Group: 006170 - GT PL Land Rights / Externally Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	5-YR Average	20	20	20	0	0	0	20	20	20
Non-Labor	5-YR Average	128	128	128	0	0	0	128	128	128
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>148</b>	<b>148</b>	<b>148</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>148</b>	<b>148</b>	<b>148</b>
FTE	5-YR Average	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00617.0  
Category: J. Land Rights (BC 617)  
Category-Sub: 1. Land Rights  
Workpaper Group: 006170 - GT PL Land Rights / Externally Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	1	0	37	50
Non-Labor	0	1	0	82	543
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>119</b>	<b>593</b>
FTE	0.0	0.0	0.0	0.4	0.6
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	2	0	0
Non-Labor	0	0	12	1	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>1</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	1	2	37	50
Non-Labor	0	1	12	83	543
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>2</b>	<b>14</b>	<b>120</b>	<b>593</b>
FTE	0.0	0.0	0.0	0.4	0.6
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	0	0	6	8
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>8</b>
FTE	0.0	0.0	0.0	0.1	0.1
<b>Escalation to 2013\$</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	1	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	0	1	3	42	58
Non-Labor	0	2	13	83	543
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>3</b>	<b>16</b>	<b>125</b>	<b>601</b>
FTE	0.0	0.0	0.0	0.5	0.7

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00617.0  
 Category: J. Land Rights (BC 617)  
 Category-Sub: 1. Land Rights  
 Workpaper Group: 006170 - GT PL Land Rights / Externally Driven

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	2	0	0
Non-Labor		0	0	12	1	0
NSE		0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>1</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011</b>	2	12	0	14	0.0	TPMJW201310291112380
Added from BC 601 for BC consolidation purposes.						
<b>2011 Total</b>	2	12	0	14	0.0	
<b>2012</b>	0	1	0	1	0.0	TPMJW201310291113500
Added from BC 601 for BC consolidation purposes.						
<b>2012 Total</b>	0	1	0	1	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 006170**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00617.0  
 Category: J. Land Rights (BC 617)  
 Category-Sub: 1. Land Rights  
 Workpaper Group: 006170 - GT PL Land Rights / Externally Driven  
 Workpaper Detail: 006170.001 - Routine on-going capital costs related to Rights of Way  
 In-Service Date: Not Applicable

Description:

Gas Transmission - Land and Right of Way
--

<b>Forecast In 2013 \$(000)</b>				
	<b>Years</b>	<u>2014</u>	<u>2015</u>	<u>2016</u>
Labor		21	21	21
Non-Labor		128	128	128
NSE		0	0	0
	<b>Total</b>	<b>149</b>	<b>149</b>	<b>149</b>
FTE		0.2	0.2	0.2

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: K. Storage - Buildings (BC 632)  
Workpaper: 006320

**Summary for Category: K. Storage - Buildings (BC 632)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	0	0	0
Non-Labor	0	24	1,589	24
NSE	0	0	0	0
<b>Total</b>	<u>0</u>	<u>24</u>	<u>1,589</u>	<u>24</u>
FTE	0.0	0.0	0.0	0.0

**006320 Gas Stor Bld'gs & Improve/ Quality/Economic Driven**

Labor	0	0	0	0
Non-Labor	0	24	1,589	24
NSE	0	0	0	0
<b>Total</b>	<u>0</u>	<u>24</u>	<u>1,589</u>	<u>24</u>
FTE	0.0	0.0	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00632.0  
 Category: K. Storage - Buildings (BC 632)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	0	
Non-Labor	Zero-Based	0	120	0	0	0	24	1,589	24
NSE	Zero-Based	0	0	0	0	0	0	0	
<b>Total</b>		<b>0</b>	<b>120</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>1,589</b>	<b>24</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Business Purpose:**

This Budget Category provides funding for construction, replacement or upgrades to building structures used by Storage operations to contain, shelter and/or protect Storage equipment such as meter stations, pressure regulating equipment or controls equipment.

**Physical Description:**

Such buildings and structures may be gauge houses, shelters for multiple critical valves or buildings providing shelter and protection for critical controls or SCADA-related equipment. Such structures and buildings vary from frame-and-stucco houses or buildings made from reinforced masonry blocks in cases where protection and security is needed. In 2015, an incremental amount of \$1.565M has been added to the 5-year average recorded cost to provide for one or more of the following at a critical storage field facility.

- Perimeter barriers & reinforced fencing
- Enhanced or added cameras at entrance points and/or perimeters
- Enhanced lock systems
- Security Guard Post

**Project Justification:**

The protection of electronic equipment from the elements is done by placing it in a suitable housing. If it is a remote location, the housing may be a hardened structure to provide additional protection from vandalism. Such protection may be required by Federal or local laws but most often is required to protect vulnerable and expensive equipment and should be considered evident and reasonable care to be taken. The incremental funds requested here are needed to increase security at one key storage facility. The need was driven by two factors. The first factor was the Transportation Security Administration (TSA) guidelines to objectively identify gas assets deemed as critical. The second factor was the various security breaches that recently occurred in the energy sector.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00632.0  
Category: K. Storage - Buildings (BC 632)  
Category-Sub: 1. Storage Building  
Workpaper Group: 006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven

**Forecast Methodology:**

**Labor - Zero-Based**

No Labor amounts in this "buildings" BC.

**Non-Labor - Zero-Based**

Recorded amounts are found only in year 2010 so used 5-year average as a base amount even though it could under-state much larger amounts encountered in future years.

**NSE - Zero-Based**

None. These are pipe or related equipment-related facilities

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00632.0  
 Category: K. Storage - Buildings (BC 632)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	0	0	0
Non-Labor	Zero-Based	24	1,589	24	0	0	0	24	1,589	24
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>24</b>	<b>1,589</b>	<b>24</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>1,589</b>	<b>24</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00632.0  
 Category: K. Storage - Buildings (BC 632)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	0	0	0	0
Non-Labor	0	102	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	102	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>102</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2013\$</b>					
Labor	0	0	0	0	0
Non-Labor	0	18	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	120	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>120</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00632.0  
 Category: K. Storage - Buildings (BC 632)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	0	0	0
Non-Labor		0	0	0	0	0
NSE		0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 006320**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00632.0  
 Category: K. Storage - Buildings (BC 632)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006320 - Gas Stor Bld'gs & Improve/ Quality/Economic Driven  
 Workpaper Detail: 006320.001 - Capital expenditures for Gas Storage Dept. buildings.  
 In-Service Date: Not Applicable  
 Description:

Forecast In 2013 \$(000)					
Years		2014	2015	2016	
Labor		0	0	0	
Non-Labor		24	1,589	24	
NSE		0	0	0	
	<b>Total</b>	<b>24</b>	<b>1,589</b>	<b>24</b>	
FTE		0.0	0.0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Category: L. Transmission - Buildings (BC 633)  
 Workpaper: 006330

**Summary for Category: L. Transmission - Buildings (BC 633)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	0	0	0
Non-Labor	0	480	8,679	11
NSE	0	0	0	0
<b>Total</b>	<u>0</u>	<u>480</u>	<u>8,679</u>	<u>11</u>
FTE	0.0	0.0	0.0	0.0

**006330 GT Bld'gs & Improve / Quality/Economic Driven**

Labor	0	0	0	0
Non-Labor	0	480	8,679	11
NSE	0	0	0	0
<b>Total</b>	<u>0</u>	<u>480</u>	<u>8,679</u>	<u>11</u>
FTE	0.0	0.0	0.0	0.0

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**006330 - GT Bld'gs & Improve / Quality/Economic Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00633.0  
 Category: L. Transmission - Buildings (BC 633)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006330 - GT Bld'gs & Improve / Quality/Economic Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	0	0	0	0	0	0	0	
Non-Labor	Zero-Based	0	0	0	11	0	480	8,679	
NSE	Zero-Based	0	0	0	0	0	0	0	
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>480</b>	<b>8,679</b>	
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

**Business Purpose:**

This Budget Category provides funding for construction, replacement or upgrades to building structures used by Transmission operations to contain, shelter and/or protect Transmission equipment such as meter stations, pressure regulating equipment, critical valves, or controls equipment.

**Physical Description:**

Such buildings and structures may be gauge houses, shelters for multiple critical valves or buildings providing shelter and protection for critical controls or SCADA-related equipment. Such structures and buildings vary from frame-and-stucco houses or buildings made from reinforced masonry blocks in cases where protection and security is needed. The estimated amount in 2014 is to provide one or more of the following at two key metering stations:

- Upgraded perimeter barriers & fencing
- Enhanced or added cameras at entrance points and/or perimeters
- Enhanced locking systems
- Security Guard kiosk

The estimated amount in 2015 is to provide the same enhancements at seven additional sites.

**Project Justification:**

The protection of electronic equipment from the elements is done by placing it in a suitable housing. If it is a remote location, the housing may be a hardened structure to provide additional protection from vandalism. Such protection may be required by Federal or local laws but most often is required to protect vulnerable and expensive equipment related to the continuity of supply into the greater Southern California area and should be considered reasonable and prudent measures. In addition, the need has been identified to harden the physical security at several locations throughout SoCalGas' service territory. The need was driven by two factors. The first factor was the Transportation Security Administration (TSA) guidelines to objectively identify gas assets deemed as critical. The second factor was the various security breaches that recently occurred affecting the energy sector.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00633.0  
Category: L. Transmission - Buildings (BC 633)  
Category-Sub: 1. Storage Building  
Workpaper Group: 006330 - GT Bld'gs & Improve / Quality/Economic Driven

**Forecast Methodology:**

**Labor - Zero-Based**

No Labor in this BC.

**Non-Labor - Zero-Based**

2014 and 2015 are from list of needed improvements in security at selected remote sites (see "Physical Description"). Used 2012 recorded actual for 2016 forecast as no charges here prior to 2012.

**NSE - Zero-Based**

None. These are pipe or related equipment-related facilities

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00633.0  
 Category: L. Transmission - Buildings (BC 633)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006330 - GT Bld'gs & Improve / Quality/Economic Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	Zero-Based	0	0	0	0	0	0	0	0	0
Non-Labor	Zero-Based	480	8,679	11	0	0	0	480	8,679	11
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>480</b>	<b>8,679</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>480</b>	<b>8,679</b>	<b>11</b>
FTE	Zero-Based	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00633.0  
 Category: L. Transmission - Buildings (BC 633)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006330 - GT Bld'gs & Improve / Quality/Economic Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	11	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	11	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2013\$</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	11	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00633.0  
 Category: L. Transmission - Buildings (BC 633)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006330 - GT Bld'gs & Improve / Quality/Economic Driven

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	0	0	0
Non-Labor		0	0	0	0	0
NSE		0	0	0	0	0
<b>Total</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 006330**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00633.0  
 Category: L. Transmission - Buildings (BC 633)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 006330 - GT Bld'gs & Improve / Quality/Economic Driven  
 Workpaper Detail: 006330.001 - Capital expenses related to Transmission buildings.  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Buildings

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		0	0	0
Non-Labor		480	8,679	11
NSE		0	0	0
	<b>Total</b>	<b>480</b>	<b>8,679</b>	<b>11</b>
FTE		0.0	0.0	0.0

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: M. Laboratory Equipment (BC 730)  
Workpaper: 007300

**Summary for Category: M. Laboratory Equipment (BC 730)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	0	1	1	1
Non-Labor	789	484	484	484
NSE	0	0	0	0
<b>Total</b>	<b>789</b>	<b>485</b>	<b>485</b>	<b>485</b>
FTE	0.0	0.1	0.1	0.1

**007300 GT Lab Equip / Quality/Economic Driven**

Labor	0	1	1	1
Non-Labor	789	484	484	484
NSE	0	0	0	0
<b>Total</b>	<b>789</b>	<b>485</b>	<b>485</b>	<b>485</b>
FTE	0.0	0.1	0.1	0.1

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**007300 - GT Lab Equip / Quality/Economic Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00730.0  
 Category: M. Laboratory Equipment (BC 730)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 007300 - GT Lab Equip / Quality/Economic Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	5-YR Average	0	4	0	0	0	1	1	1
Non-Labor	5-YR Average	315	744	330	240	789	484	484	484
NSE	5-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>315</b>	<b>748</b>	<b>330</b>	<b>241</b>	<b>789</b>	<b>485</b>	<b>485</b>	<b>485</b>
FTE	5-YR Average	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

**Business Purpose:**

Equip the Engineering Analysis Center with modern, state-of-the-art laboratory equipment necessary to maintain the Company's ability to perform necessary analysis and evaluation of materials, emissions and technology.

**Physical Description:**

Tools used by laboratory personnel are frequently sensitive instruments for measuring a variety of materials, substances and gases including emissions. Other equipment may be ovens, burners, microscopes, scales and handling equipment.

**Project Justification:**

Regulations are already in process requiring equipment upgrades for both pipeline and engine monitoring. Equipment replacement schedules are developed based on equipment life and past practices thus requiring purchase of new equipment. Laboratory-grade equipment will continue to evolve and become more costly.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00730.0  
Category: M. Laboratory Equipment (BC 730)  
Category-Sub: 1. Storage Building  
Workpaper Group: 007300 - GT Lab Equip / Quality/Economic Driven

**Forecast Methodology:**

**Labor - 5-YR Average**

There is only minimal labor forecasted for Laboratory Equipment purchases.

**Non-Labor - 5-YR Average**

Used 5-yr average. Most recent five years appear representative for future costs.

**NSE - 5-YR Average**

None.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00730.0  
 Category: M. Laboratory Equipment (BC 730)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 007300 - GT Lab Equip / Quality/Economic Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	5-YR Average	0	0	0	0	0	0	0	0	0
Non-Labor	5-YR Average	483	483	483	0	0	0	483	483	483
NSE	5-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>483</b>	<b>483</b>	<b>483</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>483</b>	<b>483</b>	<b>483</b>
FTE	5-YR Average	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014</b>	0	0	0	0	0.1	TPGMG201403131
For Labor Dollars - GMG						
<b>2014 Total</b>	0	0	0	0	0.1	
<b>2015</b>	0	0	0	0	0.1	TPGMG201403131
For Labor dollars - GMG						
<b>2015 Total</b>	0	0	0	0	0.1	
<b>2016</b>	0	0	0	0	0.1	TPGMG201403131
For Labor Dollars - GMG						
<b>2016 Total</b>	0	0	0	0	0.1	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00730.0  
Category: M. Laboratory Equipment (BC 730)  
Category-Sub: 1. Storage Building  
Workpaper Group: 007300 - GT Lab Equip / Quality/Economic Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	3	0	0	0
Non-Labor	256	632	307	241	789
NSE	0	0	0	0	0
<b>Total</b>	<b>256</b>	<b>635</b>	<b>307</b>	<b>241</b>	<b>789</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	3	0	0	0
Non-Labor	256	632	307	241	789
NSE	0	0	0	0	0
<b>Total</b>	<b>256</b>	<b>635</b>	<b>307</b>	<b>241</b>	<b>789</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2013\$</b>					
Labor	0	1	0	0	0
Non-Labor	58	112	23	-1	0
NSE	0	0	0	0	0
<b>Total</b>	<b>58</b>	<b>113</b>	<b>23</b>	<b>-1</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	0	4	0	0	0
Non-Labor	315	744	330	240	789
NSE	0	0	0	0	0
<b>Total</b>	<b>315</b>	<b>748</b>	<b>330</b>	<b>241</b>	<b>789</b>
FTE	0.0	0.0	0.0	0.0	0.0

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00730.0  
 Category: M. Laboratory Equipment (BC 730)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 007300 - GT Lab Equip / Quality/Economic Driven

**Adjustments to Recorded:**

		In Nominal \$(000)				
Years		2009	2010	2011	2012	2013
Labor		0	0	0	0	0
Non-Labor		0	0	0	0	0
NSE		0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE		0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 007300**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00730.0  
 Category: M. Laboratory Equipment (BC 730)  
 Category-Sub: 1. Storage Building  
 Workpaper Group: 007300 - GT Lab Equip / Quality/Economic Driven  
 Workpaper Detail: 007300.001 - Specialized Laboratory Equipment purchases.  
 In-Service Date: Not Applicable  
 Description:

Gas Transmission - Laboratory Equipment.

Forecast In 2013 \$(000)				
	Years	2014	2015	2016
Labor		1	1	1
Non-Labor		484	484	484
NSE		0	0	0
	<b>Total</b>	<b>485</b>	<b>485</b>	<b>485</b>
FTE		0.1	0.1	0.1

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Category: N. Capital Tools (BC 736)  
Workpaper: 007360

**Summary for Category: N. Capital Tools (BC 736)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	8	9	9	9
Non-Labor	832	678	678	678
NSE	0	0	0	0
<b>Total</b>	<b>840</b>	<b>687</b>	<b>687</b>	<b>687</b>
FTE	0.1	0.1	0.1	0.1

**007360 GT & Stor Cap Tools / Quality/Economic Driven**

Labor	8	9	9	9
Non-Labor	832	678	678	678
NSE	0	0	0	0
<b>Total</b>	<b>840</b>	<b>687</b>	<b>687</b>	<b>687</b>
FTE	0.1	0.1	0.1	0.1

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**007360 - GT & Stor Cap Tools / Quality/Economic Driven**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00736.0  
 Category: N. Capital Tools (BC 736)  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007360 - GT & Stor Cap Tools / Quality/Economic Driven

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	3-YR Average	-1	10	14	5	8	9	9	9
Non-Labor	3-YR Average	102	130	634	567	832	678	678	678
NSE	3-YR Average	0	0	0	0	0	0	0	0
<b>Total</b>		<b>101</b>	<b>141</b>	<b>647</b>	<b>573</b>	<b>840</b>	<b>687</b>	<b>687</b>	<b>687</b>
FTE	3-YR Average	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1

**Business Purpose:**

This Budget Code (BC) provides for acquiring and replacing high-value tools used on a daily basis by the operating people of Transmission and Storage.

**Physical Description:**

Hand tools, Volt/Amp Meters, GPS receivers, leak detection equipment, methane detectors, gauges, wrenches, tapping and stopping equipment, etc.

**Project Justification:**

Purchases are mostly to replace old, worn or damaged tools used in the field. Such tools are used on a daily basis by personnel installing and maintaining Transmission and Storage equipment and assets. Additional methane detectors may have to be obtained due to Greenhouse Gas Emissions-related legislation.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00736.0  
Category: N. Capital Tools (BC 736)  
Category-Sub: 1. Capital Tools  
Workpaper Group: 007360 - GT & Stor Cap Tools / Quality/Economic Driven

**Forecast Methodology:**

**Labor - 3-YR Average**

Almost no labor in this Capital Tools account. Used 3-yr average; same as non-labor.

**Non-Labor - 3-YR Average**

Used 3-yr average for forecast 2011, 2012 and 2013 are significantly higher than 2009 and 2010 recorded amounts and are thus more representative and more recent.

**NSE - 3-YR Average**

None.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00736.0  
 Category: N. Capital Tools (BC 736)  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007360 - GT & Stor Cap Tools / Quality/Economic Driven

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	3-YR Average	8	8	8	0	0	0	8	8	8
Non-Labor	3-YR Average	677	677	677	0	0	0	677	677	677
NSE	3-YR Average	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>685</b>	<b>685</b>	<b>685</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>685</b>	<b>685</b>	<b>685</b>
FTE	3-YR Average	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00736.0  
Category: N. Capital Tools (BC 736)  
Category-Sub: 1. Capital Tools  
Workpaper Group: 007360 - GT & Stor Cap Tools / Quality/Economic Driven

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	7	11	5	6
Non-Labor	83	111	589	569	832
NSE	0	0	0	0	0
<b>Total</b>	<b>83</b>	<b>118</b>	<b>600</b>	<b>574</b>	<b>839</b>
FTE	0.0	0.1	0.1	0.1	0.1
<b>Adjustments (Nominal \$)**</b>					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	0	7	11	5	6
Non-Labor	83	111	589	569	832
NSE	0	0	0	0	0
<b>Total</b>	<b>83</b>	<b>118</b>	<b>600</b>	<b>574</b>	<b>839</b>
FTE	0.0	0.1	0.1	0.1	0.1
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	0	1	2	1	1
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Escalation to 2013\$</b>					
Labor	0	2	1	0	0
Non-Labor	19	20	45	-2	0
NSE	0	0	0	0	0
<b>Total</b>	<b>19</b>	<b>21</b>	<b>46</b>	<b>-2</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	-1	10	14	5	8
Non-Labor	102	130	634	567	832
NSE	0	0	0	0	0
<b>Total</b>	<b>101</b>	<b>141</b>	<b>647</b>	<b>573</b>	<b>840</b>
FTE	0.0	0.1	0.1	0.1	0.1

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00736.0  
 Category: N. Capital Tools (BC 736)  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007360 - GT & Stor Cap Tools / Quality/Economic Driven

**Adjustments to Recorded:**

In Nominal \$(000)					
Years	2009	2010	2011	2012	2013
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009 Total</b>	0	0	0	0	0.0	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 007360**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00736.0  
 Category: N. Capital Tools (BC 736)  
 Category-Sub: 1. Capital Tools  
 Workpaper Group: 007360 - GT & Stor Cap Tools / Quality/Economic Driven  
 Workpaper Detail: 007360.001 - Monthly allocation of Gas Transmission & Storage Capital Tool purchases.  
 In-Service Date: Not Applicable  
 Description:

Forecast In 2013 \$(000)				
Years		2014	2015	2016
Labor		9	9	9
Non-Labor		678	678	678
NSE		0	0	0
	<b>Total</b>	<b>687</b>	<b>687</b>	<b>687</b>
FTE		0.1	0.1	0.1

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Category: O. Supervision & Engineering Pool (BC 908)  
 Workpaper: 009080

**Summary for Category: O. Supervision & Engineering Pool (BC 908)**

	In 2013\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2013	2014	2015	2016
Labor	1,741	1,828	2,251	2,442
Non-Labor	-3	67	67	67
NSE	0	0	0	0
<b>Total</b>	<b>1,738</b>	<b>1,895</b>	<b>2,318</b>	<b>2,509</b>
FTE	16.8	16.6	20.2	21.7

**009080 Transmission & Storage S&E Pool**

Labor	1,741	1,828	2,251	2,442
Non-Labor	-3	67	67	67
NSE	0	0	0	0
<b>Total</b>	<b>1,738</b>	<b>1,895</b>	<b>2,318</b>	<b>2,509</b>
FTE	16.8	16.6	20.2	21.7

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Group**  
**009080 - Transmission & Storage S&E Pool**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00908.0  
 Category: O. Supervision & Engineering Pool (BC 908)  
 Category-Sub: 1. Supervision & Engineering Pool  
 Workpaper Group: 009080 - Transmission & Storage S&E Pool

**Summary of Results (Constant 2013 \$ in 000s):**

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2009	2010	2011	2012	2013	2014	2015	2016
<b>Years</b>									
Labor	Zero-Based	1,648	1,528	1,793	1,467	1,741	1,828	2,251	2,442
Non-Labor	Zero-Based	28	139	67	101	-3	67	67	67
NSE	Zero-Based	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1,676</b>	<b>1,668</b>	<b>1,861</b>	<b>1,568</b>	<b>1,738</b>	<b>1,895</b>	<b>2,318</b>	<b>2,509</b>
FTE	Zero-Based	13.6	14.8	17.7	14.3	16.8	16.6	20.2	21.7

**Business Purpose:**

Provide a pool for Supervision & Engineering (S&E) charges that will be reassigned to the various budget categories on a direct basis. Charges reside in this Budget Category temporarily and are reassigned on a monthly basis. In addition to the 5-year average are added 1.2 FTEs in 2014, 4.4 FTEs in 2015, and 5.9 FTE's in 2016. These are to reinforce job recordkeeping, QA, and QC on major Transmission projects and due to the upshift in the number of projects in the Transmission capital categories.

**Physical Description:**

Overhead charges stemming from labor spend on capital projects and reassigned to Capital budget categories specific to the Transmission & Storage activities.

**Project Justification:**

Continues an established accounting procedure for making charges for certain overheads, on a direct cost basis to Transmission's budget categories. The incremental amount added here is to fund a portion of the newly-created Major Projects department which has responsibilities and costs not included in previous rate case applications. Major Projects is new organization at SoCalGas that has been established to provide cost, schedule, risk, quality control and change control management for major construction projects. Projected growth in the number and complexity of Transmission and Storage capital projects drives the requirement for increasing the potential for successfully managing the costs, schedule, risk and quality of these projects. An effective approach to support this goal is a centralized project controls and quality management groups that can take the burden of analyzing and developing cost forecasting, cost estimating, schedule updating and analysis, and risk analysis, off of the project manager's work plate, and conduct these activities using a unified methodology based on project controls and quality risk and compliance practices.

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00908.0  
Category: O. Supervision & Engineering Pool (BC 908)  
Category-Sub: 1. Supervision & Engineering Pool  
Workpaper Group: 009080 - Transmission & Storage S&E Pool

**Forecast Methodology:**

**Labor - Zero-Based**

Used 5-yr average plus incremental amount as described above for Major Projects augmentation of Transmission project controls & technology, quality, risk, and compliance management, and overall direction of this new department.

**Non-Labor - Zero-Based**

Used 5-yr average amount only.

**NSE - Zero-Based**

There are no NSE amounts in this BC

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00908.0  
 Category: O. Supervision & Engineering Pool (BC 908)  
 Category-Sub: 1. Supervision & Engineering Pool  
 Workpaper Group: 009080 - Transmission & Storage S&E Pool

**Adjustments to Forecast**

In 2013 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2014	2015	2016	2014	2015	2016	2014	2015	2016
Labor	Zero-Based	1,828	2,251	2,442	0	0	0	1,828	2,251	2,442
Non-Labor	Zero-Based	67	67	67	0	0	0	67	67	67
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
<b>Total</b>		<b>1,895</b>	<b>2,318</b>	<b>2,509</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,895</b>	<b>2,318</b>	<b>2,509</b>
FTE	Zero-Based	16.6	20.2	21.7	0.0	0.0	0.0	16.6	20.2	21.7

**Forecast Adjustment Details**

<u>Year/Explanation</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>	<u>RefID</u>
<b>2014 Total</b>	0	0	0	0	0.0	
<b>2015 Total</b>	0	0	0	0	0.0	
<b>2016 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
Witness: Raymond K. Stanford  
Budget Code: 00908.0  
Category: O. Supervision & Engineering Pool (BC 908)  
Category-Sub: 1. Supervision & Engineering Pool  
Workpaper Group: 009080 - Transmission & Storage S&E Pool

**Determination of Adjusted-Recorded:**

	2009 (\$000)	2010 (\$000)	2011 (\$000)	2012 (\$000)	2013 (\$000)
<b>Recorded (Nominal \$)*</b>					
Labor	0	1,105	1,430	1,269	1,493
Non-Labor	0	118	63	101	-3
NSE	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>1,223</b>	<b>1,492</b>	<b>1,370</b>	<b>1,490</b>
FTE	0.0	12.5	15.1	12.3	14.4
<b>Adjustments (Nominal \$)**</b>					
Labor	1,136	0	0	0	0
Non-Labor	23	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>1,159</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	11.4	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Nominal \$)</b>					
Labor	1,136	1,105	1,430	1,269	1,493
Non-Labor	23	118	63	101	-3
NSE	0	0	0	0	0
<b>Total</b>	<b>1,159</b>	<b>1,223</b>	<b>1,492</b>	<b>1,370</b>	<b>1,490</b>
FTE	11.4	12.5	15.1	12.3	14.4
<b>Vacation &amp; Sick (Nominal \$)</b>					
Labor	205	193	237	203	248
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>205</b>	<b>193</b>	<b>237</b>	<b>203</b>	<b>248</b>
FTE	2.2	2.3	2.6	2.0	2.4
<b>Escalation to 2013\$</b>					
Labor	306	230	126	-5	0
Non-Labor	5	21	5	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>311</b>	<b>252</b>	<b>131</b>	<b>-5</b>	<b>0</b>
FTE	0.0	0.0	0.0	0.0	0.0
<b>Recorded-Adjusted (Constant 2013\$)</b>					
Labor	1,648	1,528	1,793	1,467	1,741
Non-Labor	28	139	67	101	-3
NSE	0	0	0	0	0
<b>Total</b>	<b>1,676</b>	<b>1,668</b>	<b>1,861</b>	<b>1,568</b>	<b>1,738</b>
FTE	13.6	14.8	17.7	14.3	16.8

\* After company-wide exclusions of Non-GRC costs

\*\* Refer to "Detail of Adjustments to Recorded" page for line item adjustments

Note: Totals may include rounding differences.

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00908.0  
 Category: O. Supervision & Engineering Pool (BC 908)  
 Category-Sub: 1. Supervision & Engineering Pool  
 Workpaper Group: 009080 - Transmission & Storage S&E Pool

**Adjustments to Recorded:**

In Nominal \$(000)					
Years	2009	2010	2011	2012	2013
Labor	1,136	0	0	0	0
Non-Labor	23	0	0	0	0
NSE	0	0	0	0	0
<b>Total</b>	<b>1,159</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
FTE	11.4	0.0	0.0	0.0	0.0

**Detail of Adjustments to Recorded in Nominal \$:**

Year/Explanation	Labor	NLbr	NSE	Total	FTE	RefID
<b>2009</b>	1,136	23	0	1,159	11.4	TPMJW20131001145719
Prior to 2010 these monies were carried in BCs 1001 (Trans) and 1002 (Storage). The sum of those BCs for 2009 is shown here for history.						
<b>2009 Total</b>	1,136	23	0	1,159	11.4	
<b>2010 Total</b>	0	0	0	0	0.0	
<b>2011 Total</b>	0	0	0	0	0.0	
<b>2012 Total</b>	0	0	0	0	0.0	
<b>2013 Total</b>	0	0	0	0	0.0	

*Note: Totals may include rounding differences.*

**Beginning of Workpaper Sub Details for  
Workpaper Group 009080**

Southern California Gas Company  
2016 GRC - APP  
Capital Workpapers

Area: GAS TRANSMISSION  
 Witness: Raymond K. Stanford  
 Budget Code: 00908.0  
 Category: O. Supervision & Engineering Pool (BC 908)  
 Category-Sub: 1. Supervision & Engineering Pool  
 Workpaper Group: 009080 - Transmission & Storage S&E Pool  
 Workpaper Detail: 009080.001 - Non-allocated sub group assigned by forecasting system  
 In-Service Date: Not Applicable  
 Description:

Forecast In 2013 \$(000)				
Years		2014	2015	2016
Labor		1,828	2,251	2,442
Non-Labor		67	67	67
NSE		0	0	0
	<b>Total</b>	<b>1,895</b>	<b>2,318</b>	<b>2,509</b>
FTE		16.6	20.2	21.7

*Note: Totals may include rounding differences.*