

Application of SOUTHERN CALIFORNIA GAS)
COMPANY for authority to update its gas revenue)
requirement and base rates)
effective January 1, 2024 (U 904-G))

Application No. 22-05-015

Exhibit No.: (SCG-10-CWP-R)

REVISED CAPITAL WORKPAPERS TO
PREPARED DIRECT TESTIMONY
OF LAWRENCE T. BITTLESTON / STEVE A. HRUBY
ON BEHALF OF SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

AUGUST 2022



2024 General Rate Case - REVISED
INDEX OF WORKPAPERS

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Overall Summary For Exhibit No. SCG-10-CWP-R

Area:	GAS STORAGE
Witness:	Lawrence T. Bittleston

In 2021 \$ (000)			
Adjusted-Forecast			
	2022	2023	2024
A. Storage Compressor Station	16,439	16,122	15,342
B. Storage Wells	83,188	58,000	57,000
C. Storage Pipelines	30,126	25,532	28,946
D. Storage Purification Equipment	11,670	7,991	11,304
E. Storage Auxillary Equipment & Infrastructure	64,772	55,634	33,958
Total	206,195	163,279	146,550

Note: Totals may include rounding differences.

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Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Category: A. Storage Compressor Station
 Workpaper: 004110

Summary for Category: A. Storage Compressor Station

	In 2021\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2021	2022	2023	2024
Labor	2,611	1,176	1,176	1,375
Non-Labor	18,043	15,263	14,946	13,967
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	20,654	16,439	16,122	15,342
FTE	19.5	8.0	8.0	8.7

004110 GAS STOR Comp Sta Add/Rpls

Labor	2,611	1,176	1,176	1,375
Non-Labor	18,043	15,263	14,946	13,967
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	20,654	16,439	16,122	15,342
FTE	19.5	8.0	8.0	8.7

Note: Totals may include rounding differences.

Beginning of Workpaper Group
004110 - GAS STOR Comp Sta Add/Rpls

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls

Summary of Results (Constant 2021 \$ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2017	2018	2019	2020	2021	2022	2023	2024
	Years								
Labor	Zero-Based	1,214	1,193	860	1,556	2,611	1,176	1,176	1,375
Non-Labor	Zero-Based	6,651	10,885	8,227	10,131	18,043	15,263	14,946	13,967
NSE	Zero-Based	0	0	0	0	0	0	0	0
	Total	7,865	12,079	9,087	11,687	20,654	16,439	16,122	15,342
FTE	Zero-Based	8.0	7.9	5.7	10.2	19.5	8.0	8.0	8.7

Business Purpose:

Scope of work varies depending on compressor availability and needs. Work includes but is not limited to overhauls, rebuilds, major equipment replacements and upgrades to assets such as critical instrumentation, power turbines, gear boxes, compressors and engines.

Physical Description:

Perform necessary replacements, installations, and upgrades at the various storage fields to promote safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required injection capacities of the main compressor units. This estimate is for replacing and/or upgrading compressor equipment.

Project Justification:

Compressor station equipment must have continuing "capital maintenance." Deferring these projects may cause equipment to shut down, which can threaten gas supply continuity in Transmission, and ultimately Distribution systems.

Note: Totals may include rounding differences.

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Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00411.0
Category: A. Storage Compressor Station
Category-Sub: 1. Storage Compressor Station
Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls

Forecast Methodology:

Labor - Zero-Based

Due to the annual variability of capital maintenance required, a zero-based methodology was used to develop the estimate. It is based on both on-site field personnel and business support related to Gas Storage operations and projects.

Non-Labor - Zero-Based

Due to the variability in work associated with Gas Storage Operations forecasts used a zero-based methodology. The forecast is based on knowledge of experienced personnel at the storage fields and quotes for necessary materials and equipment.

NSE - Zero-Based

n/a

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Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls

Summary of Adjustments to Forecast

In 2021 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2022	2023	2024	2022	2023	2024	2022	2023	2024
Labor	Zero-Based	1,176	1,176	1,375	0	0	0	1,176	1,176	1,375
Non-Labor	Zero-Based	15,263	14,946	13,967	0	0	0	15,263	14,946	13,967
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
Total		16,439	16,122	15,342	0	0	0	16,439	16,122	15,342
FTE	Zero-Based	8.0	8.0	8.7	0.0	0.0	0.0	8.0	8.0	8.7

Forecast Adjustment Details

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2022 Total	0	0	0	0	0.0
2023 Total	0	0	0	0	0.0
2024 Total	0	0	0	0	0.0

Note: Totals may include rounding differences.

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Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00411.0
Category: A. Storage Compressor Station
Category-Sub: 1. Storage Compressor Station
Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls

Determination of Adjusted-Recorded:

	2017 (\$000)	2018 (\$000)	2019 (\$000)	2020 (\$000)	2021 (\$000)
Recorded (Nominal \$)*					
Labor	775	805	599	1,150	2,184
Non-Labor	4,963	8,603	6,812	8,807	17,172
NSE	0	0	0	0	0
Total	5,738	9,407	7,411	9,957	19,356
FTE	6.8	6.7	4.8	8.5	16.1
Adjustments (Nominal \$)**					
Labor	0	0	0	0	35
Non-Labor	0	0	0	0	871
NSE	0	0	0	0	0
Total	0	0	0	0	906
FTE	0.0	0.0	0.0	0.0	0.3
Recorded-Adjusted (Nominal \$)					
Labor	775	805	599	1,150	2,219
Non-Labor	4,963	8,603	6,812	8,807	18,043
NSE	0	0	0	0	0
Total	5,738	9,407	7,411	9,957	20,262
FTE	6.8	6.7	4.8	8.5	16.4
Vacation & Sick (Nominal \$)					
Labor	131	138	114	203	392
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	131	138	114	203	392
FTE	1.2	1.2	0.9	1.7	3.1
Escalation to 2021\$					
Labor	308	250	148	203	0
Non-Labor	1,688	2,283	1,415	1,324	0
NSE	0	0	0	0	0
Total	1,996	2,533	1,563	1,528	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2021\$)					
Labor	1,214	1,193	860	1,556	2,611
Non-Labor	6,651	10,885	8,227	10,131	18,043
NSE	0	0	0	0	0
Total	7,865	12,079	9,087	11,687	20,654
FTE	8.0	7.9	5.7	10.2	19.5

* 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.

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Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls

Summary of Adjustments to Recorded:

In Nominal \$(000)					
Years	2017	2018	2019	2020	2021
Labor	0	0	0	0	35
Non-Labor	0	0	0	0	871
NSE	0	0	0	0	0
Total	0	0	0	0	906
FTE	0.0	0.0	0.0	0.0	0.3

Detail of Adjustments to Recorded in Nominal \$:

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2017 Total	0	0	0	0	0.0
2018 Total	0	0	0	0	0.0
2019 Total	0	0	0	0	0.0
2020 Total	0	0	0	0	0.0
2021	35	871	0	906	0.3
Explanation:	Costs are incurred by Storage for base capital activities.				
2021 Total	35	871	0	906	0.3

Note: Totals may include rounding differences.

**Beginning of Workpaper Sub Details for
Workpaper Group 004110**

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls
 Workpaper Detail: 004110.001 - RAMP STORAGE COMPRESSOR STATION ADD/REPLACEMENT
 In-Service Date: Not Applicable
 Description:

RAMP Aliso Canyon Gas Compressors

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		118	118	118
Non-Labor		6,373	5,704	3,471
NSE		0	0	0
	Total	6,491	5,822	3,589
FTE		1.1	1.1	1.1

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls
 Workpaper Detail: 004110.001 - RAMP STORAGE COMPRESSOR STATION ADD/REPLACEMENT

RAMP Item # 1

RAMP Activity

RAMP Chapter: SCG-Risk-4 Incident Related to the Storage System (Excluding Dig-in)

RAMP Line Item ID: C06

RAMP Line Item Name: Compressor Overhauls

Tranche(s): Tranche1: Above Ground Facilities

GRC Forecast Cost Estimates (\$000)

	2021 Historical Embedded Costs (2021 \$)	2022 Forecast (2021 \$)	2023 Forecast (2021 \$)	2024 Forecast (2021 \$)	2022 to 2024 Forecast (2021 \$)	2022 to 2024 RAMP Range (2020 Incurred \$)	
						Low	High
Tranche 1 Cost Estimate	11,790	16,439	16,122	15,342	47,903	13,232	17,902

Cost Estimate Changes from RAMP:

xx

GRC Work Unit/Activity Level Estimates

Unit of Measure	2021 Historical Embedded Activities	2022 Forecast Activities	2023 Forecast Activities	2024 Forecast Activities	2022 to 2024 Forecast Activities	2022 to 2024 RAMP Range Activities	
						Low	High
Tranche 1 # Storage Fields	4.00	4.00	4.00	4.00	12.00	12.00	18.00

Work Unit Changes from RAMP:

xx

Risk Spend Efficiency (RSE)

	GRC RSE	RAMP RSE
Tranche 1	0.700	1.000

RSE Changes from RAMP:

xx

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Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls
 Workpaper Detail: 004110.002 - RAMP STORAGE COMPRESSOR STATION ADD/REPLACEMENT (Same RAMP item as 004110.001)
 In-Service Date: Not Applicable

Description:

RAMP Storage Gas Compressor HR. Same RAMP items as 004110.001.

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		71	71	71
Non-Labor		2,489	1,815	1,815
NSE		0	0	0
	Total	2,560	1,886	1,886
FTE		0.7	0.7	0.7

Note: Totals may include rounding differences.

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Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls
 Workpaper Detail: 004110.003 - RAMP STORAGE COMPRESSOR STATION ADD/REPLACEMENT (Same RAMP item as 004110.001)
 In-Service Date: Not Applicable

Description:

RAMP Storage Compressor LG. Same RAMP item as 004110.001

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		71	71	71
Non-Labor		1,203	3,110	1,056
NSE		0	0	0
	Total	1,274	3,181	1,127
FTE		0.7	0.7	0.7

Note: Totals may include rounding differences.

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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls
 Workpaper Detail: 004110.004 - RAMP STORAGE COMPRESSOR STATION ADD/REPLACEMENT (Same RAMP item as 004110.001)
 In-Service Date: Not Applicable

Description:

RAMP Storage Gas Compressor PDR. Same RAMP item as 004110.001

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		71	71	71
Non-Labor		1,994	1,623	406
NSE		0	0	0
	Total	2,065	1,694	477
FTE		0.8	0.8	0.8

Note: Totals may include rounding differences.

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Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00411.0
 Category: A. Storage Compressor Station
 Category-Sub: 1. Storage Compressor Station
 Workpaper Group: 004110 - GAS STOR Comp Sta Add/Rpls
 Workpaper Detail: 004110.005 - RAMP STORAGE COMPRESSOR STATION ADD/REPLACEMENT (Same RAMP item as 004110.001)
 In-Service Date: Not Applicable

Description:

RAMP Storage Gas Compressor Blanket all fields. Same RAMP item as 004110.001

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		845	845	1,044
Non-Labor		3,204	2,694	7,219
NSE		0	0	0
	Total	4,049	3,539	8,263
FTE		4.7	4.7	5.4

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper Group 004110

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Capital Workpapers

Witness: Larry Bittleston
Budget Code: 00411.000
Category: A. COMPRESSORS
Category Sub: GAS COMP

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$1,176	\$1,176	\$1,375
Non-Labor	Zero-Based	\$15,263	\$14,946	\$13,978
NSE	Zero-Based			
Total		\$16,439	\$16,122	\$15,353
FTE	Zero-Based	8	8	8.7

Witness: Larry Bittleston
Budget Code: 00411.001
Category: A. COMPRESSORS
Category Sub: AC GAS COMP

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$118	\$118	\$118
Non-Labor	Zero-Based	\$6,373	\$5,704	\$3,471
NSE	Zero-Based			
Total		\$6,491	\$5,822	\$3,589
FTE	Zero-Based	1.1	1.1	1.1

Business Purpose:

Scope of work varies depending on compressor availability and needs. Work includes but is not limited to overhauls, rebuilds, major equipment replacements and upgrades in the Aliso Canyon Storage Facility to assets such as critical instrumentation, power turbines, gear boxes, compressors, and engines.

Physical Description:

Perform necessary replacements, installations, and upgrades at the Aliso Canyon Storage Facility to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required injection capacities of the main compressor units. This estimate is for replacing and/or upgrading compressor equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Larger Projects:

- AC - KVS Coolers Repl Project (E6-E8) P1, 2022-2024 Forecast: \$12M(\$4M/Yr 2022-2024)
Scope includes engineering, design, procurement, installation, and commissioning for the replacement of existing KVS coolers (K1, K2 and K3). Existing KVS fin fan coolers and their structural support dating from the 60's will be replaced with new, more efficient, fin fan

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coolers and their structural support. Each new cooling bundle will handle engine jacket water, lubrication oil water, and air manifold cooling water.

- AC SCADA UPS Upgrade, 2022-2024 Forecast: 2022-2024 Forecast: \$5.75M (\$3.250M 2022 + 2.5M 2023)
Main plant (SCADA BLDG & PHONE RM) and DEHY2 SCADA UPS systems will be upgraded with a more reliable system capable of handling potential additional loads. HVAC systems and associated alarms will be upgraded to provide a proper conditioned space and 6 hours of backup power providing the needed safety for battery systems.
- PH1: AC-TDC Decommissioning & Demolition 2022-2024 Forecast: \$2.5M (\$2.5M 2022)
This is a decommissioning, abatement, demolition and site restoration project of a retired natural gas turbine drive compressor station. Scope will include Isolation and removal of Natural Gas Supply, Fuel Gas Supply, Blowdown, ESD, Electrical, Oil, Water, Air, Sewer lines, Isolation of SCADA and removal of PLC's, logic, and alarms, Abatement of Heavy metals and asbestos, Scrap, demolish concrete/asphalt, recover assets, restore site. This is the last Compliance phase of a larger California Public Utilities Commission (CPUC) approved Aliso Canyon Turbine Replacement (ACTR) project that has spanned several years.

Project Justification:

Compressor station equipment must have continued "capital maintenance". Deferring these projects may cause equipment to shut down, which can threaten gas supply continuity in Transmission, and ultimately Distribution, systems.

Witness: Larry Bittleston
 Budget Code: 00411.002
 Category: A. COMPRESSORS
 Category Sub: HR GAS COMP

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$71	\$71	\$71
Non-Labor	Zero-Based	\$2,489	1,815	\$1,815
NSE	Zero-Based			
Total		\$2,560	\$1,886	\$1,886
FTE	Zero-Based	0.7	0.7	0.7

Business Purpose:

Scope of work varies depending on compressor availability and needs. Work includes but is not limited to overhauls, rebuilds, major equipment replacements and upgrades in the Honor Rancho Storage Facility to assets such as critical instrumentation, power turbines, gear boxes, compressors, and engines.

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Physical Description:

Perform necessary replacements, installations, and upgrades at the Honor Rancho Storage Facility to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required injection capacities of the main compressor units. This estimate is for replacing and/or upgrading compressor equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Project Justification:

Compressor station equipment must have continued "capital maintenance". Deferring these projects may cause equipment to shut down, which can threaten gas supply continuity in Transmission, and ultimately Distribution, systems.

Witness: Larry Bittleston
 Budget Code: 00411.003
 Category: A. COMPRESSORS
 Category Sub: LG GAS COMP

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$71	\$71	\$71
Non-Labor	Zero-Based	\$1,203	\$3,110	\$1,056
NSE	Zero-Based			
Total		\$1,274	\$3,181	\$1,127
FTE	Zero-Based	0.7	0.7	0.7

Business Purpose:

Scope of work varies depending on compressor availability and needs. Work includes but is not limited to overhauls, rebuilds, major equipment replacements and upgrades in the La Goleta Storage Facility to assets such as critical instrumentation, power turbines, gear boxes, compressors, and engines.

Physical Description:

Perform necessary replacements, installations, and upgrades at the La Goleta Storage Facility to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required injection capacities of the main compressor units. This estimate is for replacing and/or upgrading compressor equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.
Larger Projects:

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- GOL - MU Engine & Compressor Overhaul Program, 2022-2024 Forecast: \$5.9M (\$1.2M 2022 + 3.5M 2023 + 1.2M 2024)

This project is the overhaul of Main Units #6 and #7 to restore and/or maintain compressors efficiency, capacity and reliability. New oil heaters will be installed to reduce operational wear on internal components which will increase time before next overhaul is needed. Main Units #6 and #7 have reached the end-of-life service and have to be overhauled in order to avoid replacing them all together. Equipment overhauls maintain system reliability. Overhauls are performed when wear and tear prescribe their need. The alternative to not performing an overhaul or replacement is total failure of the equipment which will shut down or cripple the function of underground storage. The needs are to maintain safe operation, to restore and/or maintain the units' efficiency, delivery capacity, maintain compliance with environmental regulations and provide reliable service. Not installing the new oil heaters will increase operational wear on internal components which will reduce time before next overhaul is needed.

Project Justification:

Compressor station equipment must have continued "capital maintenance". Deferring these projects may cause equipment to shut down, which can threaten gas supply continuity in Transmission, and ultimately Distribution, systems.

Witness: Larry Bittleston
Budget Code: 00411.004
Category: A. COMPRESSORS
Category Sub: PDR GAS COMP

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$71	\$71	\$71
Non-Labor	Zero-Based	\$1,994	\$1,623	\$406
NSE	Zero-Based			
Total		\$2,065	\$1,694	\$477
FTE	Zero-Based	0.8	0.8	0.8

Business Purpose:

Scope of work varies depending on compressor availability and needs. Work includes but is not limited to overhauls, rebuilds, major equipment replacements and upgrades in the La Goleta Storage Facility to assets such as critical instrumentation, power turbines, gear boxes, compressors, and engines.

Physical Description:

Perform necessary replacements, installations, and upgrades at the Playa Del Ray Facility to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required injection capacities of the main compressor units. This estimate is for replacing and/or upgrading compressor equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Larger Projects:

- P1: PDR-Wet Gas Compressor, 2022-2024 Forecast: \$2.5 (\$1.5M 2022 + 1.0M 2023)
This project will include the installation of two electrically driven compressor skid packages, liquid handling equipment and enclosure for noise mitigation. The facility is currently operating a rental unit for compression of wet gas from the tank farm. The unit is currently being operated for testing purpose. Without the installation of the permanent units, the station could experience increase in shut-ins due to the interruption of the system for routine and non-routine maintenance of the temporary rental unit.

Project Justification:

Compressor station equipment must have continued "capital maintenance". Deferring these projects may cause equipment to shut down, which can threaten gas supply continuity in Transmission, and ultimately Distribution, systems.

Witness: Larry Bittleston
Budget Code: 00411.005
Category: A. COMPRESSORS
Category Sub: BLANKET ALL FIELDS

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$847	\$847	\$1,046
Non-Labor	Zero-Based	\$3,204	\$2,694	\$7,230
NSE	Zero-Based			
Total		\$4,051	\$3,541	\$8,276
FTE	Zero-Based	4.7	4.7	5.4

Business Purpose:

Scope of work varies depending on compressor availability and needs. Work includes but is not limited to overhauls, rebuilds, major equipment replacements and upgrades to assets such as critical instrumentation, power turbines, gear boxes, compressors, and engines.

Physical Description:

Perform necessary replacements, installations, and upgrades at the various storage fields to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet

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Capital Workpapers

the required injection capacities of the main compressor units. This estimate is for replacing and/or upgrading compressor equipment that will be accomplished via smaller projects not qualifying for individual work papers. This will be worked as " Blanket" projects and will vary from tens of thousands to several hundreds of thousands of dollars. Individual jobs in the budget code will vary from under \$10,000 to as high as several hundreds of thousands of dollars.

Project Justification:

Compressor station equipment must have continued "capital maintenance". Deferring these projects may cause equipment to shut down, which can threaten gas supply continuity in Transmission, and ultimately Distribution, systems.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Category: B. Storage Wells
Workpaper: 004120

Summary for Category: B. Storage Wells

	In 2021\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2021	2022	2023	2024
Labor	999	588	588	588
Non-Labor	79,722	82,600	57,412	56,412
NSE	0	0	0	0
Total	80,721	83,188	58,000	57,000
FTE	7.1	4.0	4.0	4.0

004120 GAS STOR Wells

Labor	999	588	588	588
Non-Labor	79,722	82,600	57,412	56,412
NSE	0	0	0	0
Total	80,721	83,188	58,000	57,000
FTE	7.1	4.0	4.0	4.0

Note: Totals may include rounding differences.

Beginning of Workpaper Group
004120 - GAS STOR Wells

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells

Summary of Results (Constant 2021 \$ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2017	2018	2019	2020	2021	2022	2023	2024
	Years								
Labor	Zero-Based	941	632	787	477	999	588	588	588
Non-Labor	Zero-Based	70,499	28,387	36,276	34,350	79,722	82,600	57,412	56,412
NSE	Zero-Based	0	0	0	0	0	0	0	0
	Total	71,440	29,018	37,062	34,827	80,721	83,188	58,000	57,000
FTE	Zero-Based	5.8	4.4	4.8	2.9	7.1	4.0	4.0	4.0

Business Purpose:

This forecast includes costs associated with drilling, abandonment, and work-over of storage wells used for the injection and withdrawal of natural gas from underground storage facilities, including wells used for liquid production and observation. Some of the costs covered in this area are for drilling, abandonment and work-over rig services, cementing and gravel packing services, packers, casing, tubing, safety valves, and well control systems.

Physical Description:

Perform necessary capital well restorations at the various storage fields to ensure safety, improve reliability and maintain the required capacities at each storage field. Individual projects in this budget code will vary from as low as \$10,000 to as high as several millions of dollars and include shallow zone work in the Aliso Canyon field, projects related to geology and storage engineering, and smaller technology upgrades.

Project Justification:

Ongoing improvements and repairs are required to maintain withdrawal and injection capacity. These projects would include well repair, abandonment and equipment replacement that would impact the deliverability from the wells.

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00412.0
Category: B. Storage Wells
Category-Sub: 1. Storage Wells
Workpaper Group: 004120 - GAS STOR Wells

Forecast Methodology:

Labor - Zero-Based

Due to the annual variability of capital maintenance required, a zero-based methodology was used to develop the estimate. It is based on both on-site field personnel and business support related to storage field well operations and projections.

Non-Labor - Zero-Based

Due to the variability in work associated with storage field well work a zero-based methodology was used for forecasting. The forecast is based on knowledge of experienced personnel at the storage fields, major equipment and material vendor quotes, and previously completed similar-sized project work.

NSE - Zero-Based

none.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells

Summary of Adjustments to Forecast

In 2021 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2022	2023	2024	2022	2023	2024	2022	2023	2024
Labor	Zero-Based	588	588	588	0	0	0	588	588	588
Non-Labor	Zero-Based	82,600	57,412	56,412	0	0	0	82,600	57,412	56,412
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
Total		83,188	58,000	57,000	0	0	0	83,188	58,000	57,000
FTE	Zero-Based	4.0	4.0	4.0	0.0	0.0	0.0	4.0	4.0	4.0

Forecast Adjustment Details

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2022 Total	0	0	0	0	0.0
2023 Total	0	0	0	0	0.0
2024 Total	0	0	0	0	0.0

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00412.0
Category: B. Storage Wells
Category-Sub: 1. Storage Wells
Workpaper Group: 004120 - GAS STOR Wells

Determination of Adjusted-Recorded:

	2017 (\$000)	2018 (\$000)	2019 (\$000)	2020 (\$000)	2021 (\$000)
Recorded (Nominal \$)*					
Labor	600	426	548	352	849
Non-Labor	52,606	22,434	30,036	29,861	79,720
NSE	0	0	0	0	0
Total	53,207	22,860	30,584	30,213	80,569
FTE	4.9	3.7	4.0	2.4	6.0
Adjustments (Nominal \$)**					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	2
NSE	0	0	0	0	0
Total	0	0	0	0	2
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	600	426	548	352	849
Non-Labor	52,606	22,434	30,036	29,861	79,722
NSE	0	0	0	0	0
Total	53,207	22,860	30,584	30,213	80,572
FTE	4.9	3.7	4.0	2.4	6.0
Vacation & Sick (Nominal \$)					
Labor	102	73	104	62	150
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	102	73	104	62	150
FTE	0.9	0.7	0.8	0.5	1.1
Escalation to 2021\$					
Labor	239	132	135	62	0
Non-Labor	17,893	5,953	6,239	4,490	0
NSE	0	0	0	0	0
Total	18,131	6,085	6,375	4,552	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2021\$)					
Labor	941	632	787	477	999
Non-Labor	70,499	28,387	36,276	34,350	79,722
NSE	0	0	0	0	0
Total	71,440	29,018	37,062	34,827	80,721
FTE	5.8	4.4	4.8	2.9	7.1

* 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
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells

Summary of Adjustments to Recorded:

In Nominal \$(000)					
Years	2017	2018	2019	2020	2021
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	2
NSE	0	0	0	0	0
Total	0	0	0	0	2
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded in Nominal \$:

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2017 Total	0	0	0	0	0.0
2018 Total	0	0	0	0	0.0
2019 Total	0	0	0	0	0.0
2020 Total	0	0	0	0	0.0
2021	0	2	0	2	0.0
Explanation:	To add material costs (6215567, 6215568) that were misclassified as indirect				
2021 Total	0	2	0	2	0.0

Note: Totals may include rounding differences.

**Beginning of Workpaper Sub Details for
Workpaper Group 004120**

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells
 Workpaper Detail: 004120.001 - RAMP Well Replacement
 In-Service Date: Not Applicable

Description:

RAMP Drill new storage well

Forecast In 2021 \$(000)				
	Years	<u>2022</u>	<u>2023</u>	<u>2024</u>
Labor		325	258	462
Non-Labor		45,528	20,373	13,486
NSE		0	0	0
	Total	<u>45,853</u>	<u>20,631</u>	<u>13,948</u>
FTE		2.0	2.0	2.0

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells
 Workpaper Detail: 004120.001 - RAMP Well Replacement

RAMP Item # 1

RAMP Activity

RAMP Chapter: SCG-Risk-4 Incident Related to the Storage System (Excluding Dig-in)

RAMP Line Item ID: C02

RAMP Line Item Name: Well Abandonment and Replacement

Tranche(s): Tranche1: Underground Component

GRC Forecast Cost Estimates (\$000)

	2021 Historical Embedded Costs (2021 \$)	2022 Forecast (2021 \$)	2023 Forecast (2021 \$)	2024 Forecast (2021 \$)	2022 to 2024 Forecast (2021 \$)	2022 to 2024 RAMP Range (2020 Incurred \$)	
						Low	High
Tranche 1 Cost Estimate	43,814	45,853	20,631	13,948	80,432	120,625	146,020

Cost Estimate Changes from RAMP:

xxxx

GRC Work Unit/Activity Level Estimates

Unit of Measure	2021 Historical Embedded Activities	2022 Forecast Activities	2023 Forecast Activities	2024 Forecast Activities	2022 to 2024 Forecast Activities	2022 to 2024 RAMP Range Activities	
						Low	High
Tranche 1 wells	4.00	4.00	2.00	0.00	6.00	23.00	28.00

Work Unit Changes from RAMP:

xxx

Risk Spend Efficiency (RSE)

	GRC RSE	RAMP RSE
Tranche 1	0.000	5.370

RSE Changes from RAMP:

xxxx

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells
 Workpaper Detail: 004120.002 - RAMP Abandonment of storage well
 In-Service Date: Not Applicable

Description:

RAMP Activity to abandon a storage well

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		208	320	105
Non-Labor		29,267	35,645	35,901
NSE		0	0	0
	Total	29,475	35,965	36,006
FTE		1.8	1.8	1.8

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells
 Workpaper Detail: 004120.002 - RAMP Abandonment of storage well

RAMP Item # 1

RAMP Activity

RAMP Chapter: SCG-Risk-4 Incident Related to the Storage System (Excluding Dig-in)

RAMP Line Item ID: C02

RAMP Line Item Name: Well Abandonment and Replacement

Tranche(s): Tranche1: Underground Component

GRC Forecast Cost Estimates (\$000)

	2021 Historical Embedded Costs (2021 \$)	2022 Forecast (2021 \$)	2023 Forecast (2021 \$)	2024 Forecast (2021 \$)	2022 to 2024 Forecast (2021 \$)	2022 to 2024 RAMP Range (2020 Incurred \$)	
						Low	High
Tranche 1 Cost Estimate	25,203	29,475	35,965	36,006	101,446	120,625	146,020

Cost Estimate Changes from RAMP:

xxx

GRC Work Unit/Activity Level Estimates

Unit of Measure	2021 Historical Embedded Activities	2022 Forecast Activities	2023 Forecast Activities	2024 Forecast Activities	2022 to 2024 Forecast Activities	2022 to 2024 RAMP Range Activities	
						Low	High
Tranche 1 wells	14.00	3.50	4.00	3.00	10.50	23.00	28.00

Work Unit Changes from RAMP:

xxx

Risk Spend Efficiency (RSE)

	GRC RSE	RAMP RSE
Tranche 1	0.000	5.370

RSE Changes from RAMP:

xxx

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells
 Workpaper Detail: 004120.003 - RAMP Workover
 In-Service Date: Not Applicable

Description:

RAMP Activity to access well and make necessary repairs

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		55	10	21
Non-Labor		7,805	1,394	7,025
NSE		0	0	0
	Total	7,860	1,404	7,046
FTE		0.2	0.2	0.2

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00412.0
 Category: B. Storage Wells
 Category-Sub: 1. Storage Wells
 Workpaper Group: 004120 - GAS STOR Wells
 Workpaper Detail: 004120.003 - RAMP Workover

RAMP Item # 1

RAMP Activity

RAMP Chapter: SCG-Risk-4 Incident Related to the Storage System (Excluding Dig-in)
 RAMP Line Item ID: C01
 RAMP Line Item Name: Integrity Demonstration, Verification and Monitoring Practices
 Tranche(s): Tranche1: Underground Components

GRC Forecast Cost Estimates (\$000)

	2021 Historical Embedded Costs (2021 \$)	2022 Forecast (2021 \$)	2023 Forecast (2021 \$)	2024 Forecast (2021 \$)	2022 to 2024 Forecast (2021 \$)	2022 to 2024 RAMP Range (2020 Incurred \$)	
						Low	High
Tranche 1 Cost Estimate	11,000	7,860	1,405	7,046	16,311	263,720	319,240

Cost Estimate Changes from RAMP:

xxxx

GRC Work Unit/Activity Level Estimates

Unit of Measure	2021 Historical Embedded Activities	2022 Forecast Activities	2023 Forecast Activities	2024 Forecast Activities	2022 to 2024 Forecast Activities	2022 to 2024 RAMP Range Activities	
						Low	High
Tranche 1 wells	5.00	5.00	4.00	2.00	11.00	174.00	210.00

Work Unit Changes from RAMP:

xx

Risk Spend Efficiency (RSE)

	GRC RSE	RAMP RSE
Tranche 1	0.300	4.000

RSE Changes from RAMP:

xx

Supplemental Workpapers for Workpaper Group 004120

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Witness: Larry Bittleston

Budget Code: 00412.000

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	588	588	588
Non-Labor	Zero-Based	82,600	57,412	56,412
NSE	Zero-Based	0	0	0
Total		83,188	58,000	57,000
FTE	Zero-Based	4.0	4.0	4.0

Witness: Larry Bittleston

Budget Code: 00412.001

Category-Sub: Well Replacements

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	325	258	462
Non-Labor	Zero-Based	45,528	20,373	13,486
NSE	Zero-Based	0	0	0
Total		45,853	20,631	13,948
FTE	Zero-Based	2.0	2.0	2.0

Business Purpose:

Drill six (6) new wells during the 2022-2024 timeframe. This is to increase deliverability at storage fields from result of seventy (70) existing storage wells and their associated deliverability lost due to well abandonments since 2016 (52 Aliso + 16 HR + 9 LG + 8 PDR). The replacement storage wells will be drilled to replace abandoned wells that were of high operating cost injection/withdrawal, observation and/or liquid removal wells.

Physical Description:

Perform the necessary replacement of seventy (70) existing wells due to required well abandonments and their associated loss of required deliverability. These projects will locate, drill and complete new replacement storage injection/withdrawal, observation and/or liquid removal wells to be strategically located through-out the Storage Fields. In 2022 4 new wells at HR, in 2023 2 new wells at HR, in 2024 0 new wells. The costs are based on recent historical well drilling costs in addition to recent vendor cost estimates.

Southern California Gas Company
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Capital Workpapers

Project Justification:

Necessary replacement of lost deliverability due to poor deliverability from a number of wells in addition to the lost withdrawal capacity from the required abandonments of existing storage wells. Phasing in the newer, higher deliverability replacement wells and eliminating the higher operating costs wells over time, will reduce the company’s long term operating costs. The replacement wells will have a higher productivity with updated design compared to the abandoned wells that are being replaced.

Witness: Larry Bittleston

Budget Code: 00412.002

Category-Sub: Well Plug & Abandon

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	208	320	105
Non-Labor	Zero-Based	29,267	35,645	35,901
NSE	Zero-Based	0	0	0
Total		29,475	35,965	36,006
FTE	Zero-Based	1.8	1.8	1.8

Business Purpose:

The abandonment of existing wells in accordance with Public Resources Code section 3208 and new regulations and/or best practices.

Physical Description:

Perform the necessary plugging and abandonment of approximately twelve to fourteen (12-14) wells in years 2022 – 2024. These existing wells are of older design, met their useful life or unproductive storage wells located in environmentally sensitive areas and located throughout the storage fields. The cost includes the material and services required to plug and abandon the selected wells in a manner that meets or exceeds the CalGEM requirements in compliance with Public Resources Code 3208. The planned abandonments are as follows: 2022: 3.5 wells, 2 AC + 1.5 PDR, 2023: 6 wells, 2 AC + 1 HR + 3 PDR, 2024: 3 wells, 2 AC + 1 HR + 0 PDR. There is also possibility of an additional 4 wells at Aliso to remain in compliance with existing and emerging regulations.

Project Justification:

The required abandonment of the wells which are beyond their useful lives; the abandonment of storage wells located in environmentally sensitive areas in accordance with SB887. Additionally, Aliso Canyon wells may be plugged and abandoned to remain in compliance with existing and emerging regulations.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Witness: Larry Bittleston

Budget Code: 00412.003

Category-Sub: Well Workovers

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	55	11	21
Non-Labor	Zero-Based	7,805	1,394	7,025
NSE	Zero-Based	0	0	0
Total		7,860	1,405	7,046
FTE	Zero-Based	0.2	0.2	0.2

Business Purpose:

Replacement or repair of downhole components in the existing well within the storage fields. The work includes replacement of tubing, packer and/or pump, addition or replacement of subsurface safety valves, repair of casing, installation of inner-string, and chemical treatment of wells for increased performance.

Physical Description:

Perform the necessary well production tubing, packer and/or pump replacements in existing storage wells as well as casing repairs or installation of innerstring, and chemical treatments. There are approximately eleven (11) workovers projected for years 2022 – 2024. The following have been identified: 2022: 5, 2 PDR + 3 HR, 2023: 4, 4HR + 0 LG, 2024: 2, 0 HR + 1 LG + 1 PDR.

Project Justification:

Replacements and repairs are necessary on well equipment. If work is not performed, the impact may lead to wells which must be isolated and taken out of service for various conditions including wellhead upgrades, damaged liners, production equipment replacement, production of reservoir sand, or fluid encroachment in to storage reservoir, leading to a diminished number of wells available for withdrawal.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Category: C. Storage Pipelines
Workpaper: 004130

Summary for Category: C. Storage Pipelines

	In 2021\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2021	2022	2023	2024
Labor	2,522	2,189	2,116	2,167
Non-Labor	31,380	27,937	23,416	26,779
NSE	0	0	0	0
Total	33,902	30,126	25,532	28,946
FTE	20.8	16.5	16.5	16.5

004130 GAS STOR Pipelines

Labor	2,522	2,189	2,116	2,167
Non-Labor	31,380	27,937	23,416	26,779
NSE	0	0	0	0
Total	33,902	30,126	25,532	28,946
FTE	20.8	16.5	16.5	16.5

Note: Totals may include rounding differences.

**Beginning of Workpaper Group
004130 - GAS STOR Pipelines**

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines

Summary of Results (Constant 2021 \$ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2017	2018	2019	2020	2021	2022	2023	2024
Years									
Labor	Zero-Based	3,022	2,276	1,970	2,200	2,522	2,189	2,116	2,167
Non-Labor	Zero-Based	25,476	19,530	17,757	31,616	31,380	27,937	23,416	26,779
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		28,498	21,805	19,727	33,816	33,902	30,126	25,532	28,946
FTE	Zero-Based	22.4	17.7	14.6	17.2	20.8	16.5	16.5	16.5

Business Purpose:

This forecast includes costs of pipelines used in the underground storage fields. Included are the costs associated with the pipe, valves, actuators, fittings, vaults, supports, pipeline cathodic protection equipment, and related instrumentation and controls for these components.

Physical Description:

This forecast includes necessary pipeline replacements, installations, relocations, abandonments and upgrades at various storage fields to address safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required capacities of various piping systems.

Project Justification:

This work is necessary for pipeline maintenance, replacements, relocations and upgrades at various storage fields to address safety, to maintain or improve reliability, and to meet the required capacities of the various piping systems.

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00413.0
Category: C. Storage Pipelines
Category-Sub: 1. Storage Pipelines
Workpaper Group: 004130 - GAS STOR Pipelines

Forecast Methodology:

Labor - Zero-Based

Due to the annual variability of capital maintenance required a zero-based methodology was used to develop the estimate. It is based on both on-site field personnel and business support related to capital maintenance.

Non-Labor - Zero-Based

Due to the variability in work associated with Gas Storage operations forecasts used a zero-based methodology. The forecast is based on knowledge of experienced personnel at the storage fields and quotes for necessary materials and equipment.

NSE - Zero-Based

None.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines

Summary of Adjustments to Forecast

In 2021 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2022	2023	2024	2022	2023	2024	2022	2023	2024
Labor	Zero-Based	2,189	2,116	2,167	0	0	0	2,189	2,116	2,167
Non-Labor	Zero-Based	27,937	23,416	26,779	0	0	0	27,937	23,416	26,779
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
Total		30,126	25,532	28,946	0	0	0	30,126	25,532	28,946
FTE	Zero-Based	16.5	16.5	16.5	0.0	0.0	0.0	16.5	16.5	16.5

Forecast Adjustment Details

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2022 Total	0	0	0	0	0.0
2023 Total	0	0	0	0	0.0
2024 Total	0	0	0	0	0.0

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00413.0
Category: C. Storage Pipelines
Category-Sub: 1. Storage Pipelines
Workpaper Group: 004130 - GAS STOR Pipelines

Determination of Adjusted-Recorded:

	2017 (\$000)	2018 (\$000)	2019 (\$000)	2020 (\$000)	2021 (\$000)
Recorded (Nominal \$)*					
Labor	1,928	1,534	1,371	1,626	2,144
Non-Labor	19,010	15,434	14,703	27,484	31,200
NSE	0	0	0	0	0
Total	20,939	16,969	16,074	29,110	33,343
FTE	19.0	15.0	12.2	14.4	17.5
Adjustments (Nominal \$)**					
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	180
NSE	0	0	0	0	0
Total	0	0	0	0	180
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Nominal \$)					
Labor	1,928	1,534	1,371	1,626	2,144
Non-Labor	19,010	15,434	14,703	27,484	31,380
NSE	0	0	0	0	0
Total	20,939	16,969	16,074	29,110	33,524
FTE	19.0	15.0	12.2	14.4	17.5
Vacation & Sick (Nominal \$)					
Labor	327	264	260	287	378
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	327	264	260	287	378
FTE	3.4	2.7	2.4	2.8	3.3
Escalation to 2021\$					
Labor	767	477	339	288	0
Non-Labor	6,466	4,095	3,054	4,132	0
NSE	0	0	0	0	0
Total	7,233	4,573	3,393	4,420	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2021\$)					
Labor	3,022	2,276	1,970	2,200	2,522
Non-Labor	25,476	19,530	17,757	31,616	31,380
NSE	0	0	0	0	0
Total	28,498	21,805	19,727	33,816	33,902
FTE	22.4	17.7	14.6	17.2	20.8

* 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
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines

Summary of Adjustments to Recorded:

In Nominal \$(000)					
Years	2017	2018	2019	2020	2021
Labor	0	0	0	0	0
Non-Labor	0	0	0	0	180
NSE	0	0	0	0	0
Total	0	0	0	0	180
FTE	0.0	0.0	0.0	0.0	0.0

Detail of Adjustments to Recorded in Nominal \$:

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2017 Total	0	0	0	0	0.0
2018 Total	0	0	0	0	0.0
2019 Total	0	0	0	0	0.0
2020 Total	0	0	0	0	0.0
2021	0	180	0	180	0.0
Explanation:	To add material costs (6215567, 6215568) that were misclassified as indirect.				
2021 Total	0	180	0	180	0.0

Note: Totals may include rounding differences.

**Beginning of Workpaper Sub Details for
Workpaper Group 004130**

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines
 Workpaper Detail: 004130.001 - Storage Pipelines

In-Service Date: Not Applicable

Description:

AC Pipeline Work

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		106	59	106
Non-Labor		1,276	1,571	4,693
NSE		0	0	0
	Total	1,382	1,630	4,799
FTE		0.5	0.3	0.5

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines
 Workpaper Detail: 004130.002 - Storage Pipelines
 In-Service Date: Not Applicable

Description:

HR Pipeline Work

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		120	59	120
Non-Labor		6,420	1,388	992
NSE		0	0	0
	Total	6,540	1,447	1,112
FTE		1.0	0.4	1.1

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines
 Workpaper Detail: 004130.003 - Storage Pipelines
 In-Service Date: Not Applicable

Description:

LG Pipeline Work

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		106	24	106
Non-Labor		1,131	137	747
NSE		0	0	0
	Total	1,237	161	853
FTE		0.5	0.3	0.7

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines
 Workpaper Detail: 004130.004 - Storage Pipeline
 In-Service Date: Not Applicable

Description:

PDR Pipeline Work

Forecast In 2021 \$(000)				
	Years	<u>2022</u>	<u>2023</u>	<u>2024</u>
Labor		106	59	106
Non-Labor		1,772	1,167	919
NSE		0	0	0
	Total	1,878	1,226	1,025
FTE		0.5	0.4	0.7

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines
 Workpaper Detail: 004130.005 - Storage Pipeline
 In-Service Date: Not Applicable

Description:

Blanket All Fields Pipeline Work

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		105	93	106
Non-Labor		1,769	3,760	3,834
NSE		0	0	0
	Total	1,874	3,853	3,940
FTE		0.5	0.5	0.7

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00413.0
 Category: C. Storage Pipelines
 Category-Sub: 1. Storage Pipelines
 Workpaper Group: 004130 - GAS STOR Pipelines
 Workpaper Detail: 004130.006 - Storage Pipeline Laterals
 In-Service Date: Not Applicable

Description:

Storage lateral

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		1,646	1,822	1,623
Non-Labor		15,569	15,393	15,594
NSE		0	0	0
	Total	17,215	17,215	17,217
FTE		13.5	14.6	12.8

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper Group 004130

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Witness: Larry Bittleston
Budget Code: 00413.000
Category: A. PIPELINE

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$2,190	\$2,117	\$2,167
Non-Labor	Zero-Based	\$27,937	\$23,416	\$26,779
NSE	Zero-Based			
Total		\$30,127	\$25,533	\$28,946
FTE	Zero-Based	16.5	16.5	16.5

Witness: Larry Bittleston
Budget Code: 00413.001
Category: A. PIPELINE
Category Sub: AC PIPELINE WORK

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$106	\$59	\$106
Non-Labor	Zero-Based	\$1,276	\$1,571	\$4,693
NSE	Zero-Based			
Total		\$1,382	\$1,629	\$4,799
FTE	Zero-Based	0.5	0.3	0.5

Business Purpose:

This Budget Code includes costs of pipeline repair/replacement used in the Aliso Canyon Storage Facility. Included are the costs associated with the pipe, valves, actuators, fittings, vaults, supports, pipeline cathodic protection equipment, and related instrumentation and controls for these components.

Physical Description:

Perform necessary pipeline replacements, installations, relocations, abandonments and upgrades at Aliso Canyon Storage Facility to address safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required capacities of various piping systems. This work paper provides for multiple smaller projects in the various storage fields not qualifying for their own work papers due to size. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate is for replacing and/or upgrading pipeline equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Larger Projects:

- AC - East Field Oil Shipping Line, 2022-2024 Forecast: \$3.4M (\$0.4M 2022 + 1.0M 2023 + 2.0M 2024)
This project is to replace the existing oil shipping line in the east field. It is precautionary to mitigate risk of line failure resulting in a spill and environmental impact to the creek area.

Project Justification:

This series of budget categories provides funding to perform necessary pipeline capital maintenance, replacements, relocations and upgrades at Aliso Canyon Storage Field to address safety, to maintain or improve reliability, and to meet the required capacities of the various piping systems.

Witness: Larry Bittleston
Budget Code: 00413.002
Category: A. PIPELINE
Category Sub: HR PIPELINE WORK

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$120	\$59	\$120
Non-Labor	Zero-Based	\$6,420	\$1,388	\$992
NSE	Zero-Based			
Total		\$6,540	\$1,447	\$1,112
FTE	Zero-Based	1.0	0.4	1.1

Business Purpose:

This Budget Code includes costs of pipeline repair/replacement used in the Honor Rancho Storage Facility. Included are the costs associated with the pipe, valves, actuators, fittings, vaults, supports, pipeline cathodic protection equipment, and related instrumentation and controls for these components

Physical Description:

Perform necessary pipeline replacements, installations, relocations, abandonments and upgrades at Honor Rancho Storage Facility to address safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required capacities of various piping systems. This work paper provides for multiple smaller projects in the various storage fields not qualifying for their own work papers due to size. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate is for replacing and/or upgrading pipeline equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Southern California Gas Company
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Capital Workpapers

Larger Projects:

- HR - Pipeline Inspection and Coating, 2022-2024 Forecast: \$6.0M (\$6.0M 2022)
Remove and abate ACM coal tar coating, inspect pipe integrity and wall thickness, and install new FBE coating on segments of B31.8 and B31.3 pipelines to improve the cathodic protection of the pipelines. This work will be from well site 17 to the main plant and well site 17 to valve station #2. Project is driven by Compliance to improve pipeline’s cathodic protection.

Project Justification:

This series of budget categories provides funding to perform necessary pipeline capital maintenance, replacements, relocations and upgrades at Honor Rancho Storage Field to address safety, to maintain or improve reliability, and to meet the required capacities of the various piping systems.

Witness: Larry Bittleston
Budget Code: 00413.003
Category: A. PIPELINE
Category Sub: LG PIPELINE WORK

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$106	\$24	\$106
Non-Labor	Zero-Based	\$1,131	\$137	\$747
NSE	Zero-Based			
Total		\$1,237	\$161	\$853
FTE	Zero-Based	0.5	0.3	0.7

Business Purpose:

This Budget Code includes costs of pipeline repair/replacement used in the La Goleta Storage Facility. Included are the costs associated with the pipe, valves, actuators, fittings, vaults, supports, pipeline cathodic protection equipment, and related instrumentation and controls for these components

Physical Description:

Perform necessary pipeline replacements, installations, relocations, abandonments and upgrades at La Goleta Storage Facility to address safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required capacities of various piping systems. This work paper provides for multiple smaller projects in the various storage fields not qualifying for their own work papers due to size. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate is for replacing and/or upgrading pipeline equipment that will be accomplished via smaller projects not qualifying for individual work papers. The smaller projects will vary from tens of thousands to \$2.5M.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Project Justification:

This series of budget categories provides funding to perform necessary pipeline capital maintenance, replacements, relocations and upgrades at La Goleta Storage Field to address safety, to maintain or improve reliability, and to meet the required capacities of the various piping systems.

Witness: Larry Bittleston
Budget Code: 00413.004
Category: A. PIPELINE
Category Sub: PDR PIPELINE WORK

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$106	\$59	\$106
Non-Labor	Zero-Based	\$1,772	1,167	\$919
NSE	Zero-Based			
Total		\$1,878	\$1,226	\$1,025
FTE	Zero-Based	0.5	0.4	0.7

Business Purpose:

This Budget Code includes costs of pipeline repair/replacement used in the Playa Del Ray Storage Facility. Included are the costs associated with the pipe, valves, actuators, fittings, vaults, supports, pipeline cathodic protection equipment, and related instrumentation and controls for these components

Physical Description:

Perform necessary pipeline replacements, installations, relocations, abandonments and upgrades at Playa Del Ray Storage Facility to address safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required capacities of various piping systems. This work paper provides for multiple smaller projects in the various storage fields not qualifying for their own work papers due to size. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate is for replacing and/or upgrading pipeline equipment that will be accomplished via smaller projects not qualifying for individual work papers. The smaller projects will vary from tens of thousands to \$2.5M.

Project Justification:

This series of budget categories provides funding to perform necessary pipeline capital maintenance, replacements, relocations and upgrades at the Playa Del Ray storage field to address safety, to maintain or improve reliability, and to meet the required capacities of the various piping systems.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Witness: Larry Bittleston
Budget Code: 00413.005
Category: A. PIPELINE
Category Sub: BLANKET ALL FIELDS

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$106	\$94	\$106
Non-Labor	Zero-Based	\$1,769	\$3,760	\$3,834
NSE	Zero-Based			
Total		\$1,875	\$3,854	\$3,940
FTE	Zero-Based	0.5	0.5	0.7

Business Purpose:

This Budget Code includes costs of pipeline repair/replacement at various Storage Facilities. Included are the costs associated with the pipe, valves, actuators, fittings, vaults, supports, pipeline cathodic protection equipment, and related instrumentation and controls for these components

Physical Description:

Perform necessary pipeline replacements, installations, relocations, abandonments and upgrades at various Storage Facilities to address safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required capacities of various piping systems. This work paper provides for multiple smaller projects in the various storage fields not qualifying for their own work papers due to size. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate is for replacing and/or upgrading pipeline equipment that will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Larger Projects:

- ALL FIELDS - Active Post '70 Work, 2022-2024 Forecast: \$5.0M (\$2.0M 2022 + \$2/0M 2023 + \$1M 2024)
Identify and remediate high pressure DOT Storage pipe segments with >20% SMYS that are “missing test records” with an installation date on or after July 1, 1970 by pressure testing or pipe replacement. Per 49 CFR Part 192 Subpart J, no person may operate a new segment of pipeline, or return to service a segment of pipeline that has been relocated or replaced until it has been tested in accordance with this subpart and to substantiate the maximum allowable operating pressure.

Project Justification:

This series of budget categories provides funding to perform necessary pipeline capital maintenance, replacements, relocations and upgrades at various storage fields to address safety, to maintain or improve reliability, and to meet the required capacities of the various piping systems.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Witness: Larry Bittleston
Budget Code: 00413.006
Category: A. PIPELINE
Category Sub: ALL FIELDS Pipeline Laterals

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$1,646	\$1,822	\$1,623
Non-Labor	Zero-Based	\$15,569	\$15,393	\$15,594
NSE	Zero-Based			
Total		\$17,215	\$17,215	\$17,217
FTE	Zero-Based	13.5	14.6	12.8

Business Purpose:

This Budget Code includes costs for installation of well lateral piping to the new gas storage wells, surface piping modifications to the existing injection and withdrawal wells and removal of lateral piping associated with abandoned well sites.

Physical Description:

Projects in this Budget Code are broadly classified into three categories. Projects represented within this Budget Code may vary from as low as a few thousand dollars to as high as several millions of dollars.

New Wells
Newly drilled Gas Storage Wells at various storage fields require surface piping and civil infrastructure to connect them to the existing field piping and valve stations for the purpose of storage gas injection and withdrawal operations. Scope will include obtaining Geotech reports and all disciplines of engineering engagement for proper project scoping and execution.

Larger Projects:

- HR-WEZU 18 B, C, and D Surface Piping. 2022-2024 Forecast: \$13M (\$ 11M 2022 + 3M 2023). Scope will include Installing surface piping and civil infrastructure at the newly drill WEZU 18 well at Honor Rancho Facility.

Well Laterals Modifications & Re-assessments
New regulatory changes require modifications to existing surface piping across various storage fields. Projects under this category will modify and reconfigure Injection and Withdrawal wells that have been identified as requiring surface piping modifications as a result of Storage Integrity Managements reassessments to comply with DOGGR/DOT requirements. All surface piping modifications will optimize capacity for Gas Withdrawal and Injection.

Scope will include modification of Piping to compensate for loss of Casing Injection Valves, installation of 4" Choke Plate assemblies, Retrofitting and Upsizing of Well Surface Piping laterals to optimize Mandated Tubing injection and Withdrawal capacity, Retrofitting and Upsizing of Production and Kill

Laterals to accommodate New Wellhead installations, Installation of New pipe supports where required to alleviate pipe stress and meet new seismic civil construction codes, Laser scanning and 3D modeling of in-service wells in AVEVA for design purposes, installation of wellhead platforms and handrails for operations, lead abatement and recoating of wellheads, platforms and handrails. Scope will also include removal of existing Casing Injection valves to comply with Mandates, removal of Inoperable Merla Chokes and 4 Mokveld adjustable Choke Valves to ensure reliability, removal of Casing and Tubing Production and Kill Surface Piping laterals from wellhead and removal of unserviceable pipe supports and substructures.

Abandonments:

Projects under this category will remove well lateral piping and pipe supports from various well sites identified by SIMP. The abandoned well sites will not be placed back into service and therefore the well lateral piping and pipe supports must be removed to clear space for new well sites or other land use requirements. Scope will include removal of existing injection/withdrawal laterals, existing kill laterals and existing pipe supports.

Project Justification:

This series of budget categories provides funding to perform necessary installation, modifications, and removal of surface piping at well sites across various storage fields to address safety, to maintain or improve reliability, and to maintain compliance with CalGEM/DOT regulations.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Category: D. Storage Purification Equipment
Workpaper: 004140

Summary for Category: D. Storage Purification Equipment

	In 2021\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2021	2022	2023	2024
Labor	388	470	470	470
Non-Labor	5,352	11,200	7,521	10,834
NSE	0	0	0	0
Total	5,740	11,670	7,991	11,304
FTE	3.1	3.3	3.3	3.3

004140 GAS STOR Purifi Equip

Labor	388	470	470	470
Non-Labor	5,352	11,200	7,521	10,834
NSE	0	0	0	0
Total	5,740	11,670	7,991	11,304
FTE	3.1	3.3	3.3	3.3

Note: Totals may include rounding differences.

**Beginning of Workpaper Group
004140 - GAS STOR Purifi Equip**

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip

Summary of Results (Constant 2021 \$ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2017	2018	2019	2020	2021	2022	2023	2024
Labor	Zero-Based	940	888	227	543	388	470	470	470
Non-Labor	Zero-Based	3,108	3,661	1,588	4,653	5,352	11,200	7,521	10,834
NSE	Zero-Based	0	0	0	0	0	0	0	0
Total		4,048	4,549	1,816	5,196	5,740	11,670	7,991	11,304
FTE	Zero-Based	7.0	6.6	1.6	4.1	3.1	3.3	3.3	3.3

Business Purpose:

This forecast includes costs of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas and related liquids removed from underground storage fields during withdrawal operations. Some examples of the type of equipment included in this area are dehydration systems, coolers, vessels, tanks, scrubbers, boilers, pumps, and associated valves, piping, power and instrumentation.

Physical Description:

Perform necessary installations, replacements, relocations and upgrades at various storage fields to address safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required capacities and specifications of various purification systems.

Project Justification:

This forecast is for the associated cost of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas delivered to or removed from underground storage fields. Some examples of the type of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power and instrumentation.

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00414.0
Category: D. Storage Purification Equipment
Category-Sub: 1. Storage Purification Equipment
Workpaper Group: 004140 - GAS STOR Purifi Equip

Forecast Methodology:

Labor - Zero-Based

Due to the annual variability of capital maintenance required, a zero-based methodology was used to develop the estimate. It is based on both on-site field personnel and business support related to Gas Storage operations and projects.

Non-Labor - Zero-Based

Due to the variability in work associated with Gas Storage operations forecasts used a zero-based methodology. The forecast is based on knowledge of experienced personnel at the storage fields and quotes for necessary materials and equipment.

NSE - Zero-Based

None.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip

Summary of Adjustments to Forecast

In 2021 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2022	2023	2024	2022	2023	2024	2022	2023	2024
Labor	Zero-Based	470	470	470	0	0	0	470	470	470
Non-Labor	Zero-Based	11,200	7,521	10,834	0	0	0	11,200	7,521	10,834
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
Total		11,670	7,991	11,304	0	0	0	11,670	7,991	11,304
FTE	Zero-Based	3.3	3.3	3.3	0.0	0.0	0.0	3.3	3.3	3.3

Forecast Adjustment Details

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2022 Total	0	0	0	0	0.0
2023 Total	0	0	0	0	0.0
2024 Total	0	0	0	0	0.0

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00414.0
Category: D. Storage Purification Equipment
Category-Sub: 1. Storage Purification Equipment
Workpaper Group: 004140 - GAS STOR Purifi Equip

Determination of Adjusted-Recorded:

	2017 (\$000)	2018 (\$000)	2019 (\$000)	2020 (\$000)	2021 (\$000)
Recorded (Nominal \$)*					
Labor	600	599	158	402	322
Non-Labor	2,320	2,893	1,315	4,044	4,439
NSE	0	0	0	0	0
Total	2,919	3,492	1,473	4,446	4,761
FTE	5.9	5.6	1.3	3.4	2.5
Adjustments (Nominal \$)**					
Labor	0	0	0	0	8
Non-Labor	0	0	0	0	913
NSE	0	0	0	0	0
Total	0	0	0	0	921
FTE	0.0	0.0	0.0	0.0	0.1
Recorded-Adjusted (Nominal \$)					
Labor	600	599	158	402	330
Non-Labor	2,320	2,893	1,315	4,044	5,352
NSE	0	0	0	0	0
Total	2,919	3,492	1,473	4,446	5,682
FTE	5.9	5.6	1.3	3.4	2.6
Vacation & Sick (Nominal \$)					
Labor	102	103	30	71	58
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	102	103	30	71	58
FTE	1.1	1.0	0.3	0.7	0.5
Escalation to 2021\$					
Labor	239	186	39	71	0
Non-Labor	789	768	273	608	0
NSE	0	0	0	0	0
Total	1,027	954	312	679	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2021\$)					
Labor	940	888	227	543	388
Non-Labor	3,108	3,661	1,588	4,653	5,352
NSE	0	0	0	0	0
Total	4,048	4,549	1,816	5,196	5,740
FTE	7.0	6.6	1.6	4.1	3.1

* 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
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip

Summary of Adjustments to Recorded:

		In Nominal \$(000)				
Years	2017	2018	2019	2020	2021	
Labor	0	0	0	0	8	
Non-Labor	0	0	0	0	913	
NSE	0	0	0	0	0	
Total	0	0	0	0	921	
FTE	0.0	0.0	0.0	0.0	0.1	

Detail of Adjustments to Recorded in Nominal \$:

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2017 Total	0	0	0	0	0.0
2018 Total	0	0	0	0	0.0
2019 Total	0	0	0	0	0.0
2020 Total	0	0	0	0	0.0
2021	8	814	0	822	0.1
Explanation:	Costs were incurred by Storage for base capital activities.				
2021	0	99	0	99	0.0
Explanation:	To add material costs (6215567, 6215568) that were misclassified as indirect.				
2021 Total	8	913	0	921	0.1

Note: Totals may include rounding differences.

**Beginning of Workpaper Sub Details for
Workpaper Group 004140**

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip
 Workpaper Detail: 004140.001 - RAMP Storage Purification Equipment

In-Service Date: Not Applicable

Description:

RAMP AC Purification Equip

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		35	5	8
Non-Labor		4,182	665	81
NSE		0	0	0
	Total	4,217	670	89
FTE		0.4	0.1	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip
 Workpaper Detail: 004140.001 - RAMP Storage Purification Equipment

RAMP Item # 1

RAMP Activity

RAMP Chapter: SCG-Risk-4 Incident Related to the Storage System (Excluding Dig-in)

RAMP Line Item ID: C07

RAMP Line Item Name: Upgrade to Purification Equipment

Tranche(s): Tranche1: Above Ground Facilities

GRC Forecast Cost Estimates (\$000)

	2021 Historical Embedded Costs (2021 \$)	2022 Forecast (2021 \$)	2023 Forecast (2021 \$)	2024 Forecast (2021 \$)	2022 to 2024 Forecast (2021 \$)	2022 to 2024 RAMP Range (2020 Incurred \$)	
						Low	High
Tranche 1 Cost Estimate	4,000	11,671	7,991	11,305	30,967	17,070	23,095

Cost Estimate Changes from RAMP:

NA

GRC Work Unit/Activity Level Estimates

Unit of Measure	2021 Historical Embedded Activities	2022 Forecast Activities	2023 Forecast Activities	2024 Forecast Activities	2022 to 2024 Forecast Activities	2022 to 2024 RAMP Range Activities	
						Low	High
Tranche 1 # Storage of Fields	4.00	4.00	4.00	4.00	12.00	12.00	12.00

Work Unit Changes from RAMP:

NA

Risk Spend Efficiency (RSE)

	GRC RSE	RAMP RSE
Tranche 1	0.100	0.000

RSE Changes from RAMP:

NA

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip
 Workpaper Detail: 004140.002 - RAMP Storage Purification Equipment (Same RAMP item as 004140.001)
 In-Service Date: Not Applicable

Description:

RAMP Storage Purification Equipment HR. Same RAMP item as 004140.001

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		11	3	10
Non-Labor		362	103	96
NSE		0	0	0
	Total	373	106	106
FTE		0.1	0.1	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip
 Workpaper Detail: 004140.003 - RAMP Storage Purification Equipment (Same RAMP item as 004140.001)
 In-Service Date: Not Applicable

Description:

RAMP Storage Purification Equipment LG. Same RAMP item as 004140.001

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		30	5	7
Non-Labor		1,783	647	20
NSE		0	0	0
	Total	1,813	652	27
FTE		0.4	0.1	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip
 Workpaper Detail: 004140.004 - RAMP Storage Purification Equipment (Same RAMP item as 004140.001)
 In-Service Date: Not Applicable
 Description:

RAMP Storage Purification Equipment PDR. Same RAMP item as 004140.001

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		314	35	40
Non-Labor		4,865	3,224	2,281
NSE		0	0	0
	Total	5,179	3,259	2,321
FTE		2.2	0.3	0.2

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00414.0
 Category: D. Storage Purification Equipment
 Category-Sub: 1. Storage Purification Equipment
 Workpaper Group: 004140 - GAS STOR Purifi Equip
 Workpaper Detail: 004140.005 - RAMP Storage Purification equipment (Same RAMP item as 004140.001)
 In-Service Date: Not Applicable
 Description:

RAMP Storage Purification Equipment Blanket all fields. Same RAMP item as 004140.001
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Forecast In 2021 \$(000)				
	Years	<u>2022</u>	<u>2023</u>	<u>2024</u>
Labor		80	422	405
Non-Labor		8	2,882	8,356
NSE		0	0	0
	Total	<u>88</u>	<u>3,304</u>	<u>8,761</u>
FTE		0.2	2.7	2.8

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper Group 004140

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Witness: Larry Bittleston
Budget Code: 00414.000
Category: A. PURIFICATION

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$470	\$470	\$470
Non-Labor	Zero-Based	\$11,200	\$7,521	\$10,834
NSE	Zero-Based			
Total		\$11,671	\$7,991	\$11,305
FTE	Zero-Based	3.3	3.3	3.3

Witness: Larry Bittleston
Budget Code: 00414.001
Category: A. PURIFICATION
Category Sub: AC PURIFICATION

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$41	\$6	\$9
Non-Labor	Zero-Based	\$4,176	\$664	\$80
NSE	Zero-Based			
Total		\$4,217	\$670	\$89
FTE	Zero-Based	0.4	0.1	0.1

Business Purpose:

This Budget Code includes costs of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas and related liquids removed from Aliso Canyon Storage Field during withdrawal operations. Some examples of the type of equipment included in this area are dehydration systems, coolers, vessels, tanks, scrubbers, boilers, pumps, and associated valves, piping, power, and instrumentation. This project provides for multiple, smaller projects not qualifying for separate work papers.

Physical Description:

Perform necessary installations, replacements, relocations and upgrades at Aliso Canyon Storage Field to address safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required capacities and specifications of various purification systems. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate includes smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Southern California Gas Company
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Larger Projects:

- AC-DEHY 2 Upgrades 2012-W/D Gas Filt, 2022-2024 Forecast: \$4.0M (\$4.0M 2022)
This project will upgrade the Dehy 2 withdrawal system by increasing withdrawal capability similar to that of Dehy 1. Upgrades will also increase equipment reliability and remote monitoring. This project will include the installation of new gas and glycol filters for improved gas conditioning. Instrumentation upgrades and installation will be completed to allow for Operator's to remotely monitor the equipment during operation. DEHY 2 currently has withdrawal capacity of 750MMSCFD. The upgrade will allow for increased withdrawal capacity of 110MMSCFD, mirroring that of Dehy 1. Without this project, the station will not have a system redundancy that enhances the ability to meet peak withdrawal deliverability while maintaining compliance with federal, state, and local codes and standards for water content in pipeline-quality natural gas.

Project Justification:

This series of Budget Codes provide for expenditures associated with the cost of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas delivered to or removed from Aliso Canyon Storage Field. Some examples of the type of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power, and instrumentation.

Witness: Larry Bittleston
Budget Code: 00414.002
Category: A. PURIFICATION
Category Sub: HR PURIFICATION

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$13	\$4	\$12
Non-Labor	Zero-Based	\$360	\$102	\$94
NSE	Zero-Based			
Total		\$373	\$106	\$106
FTE	Zero-Based	0.1	0.1	0.1

Business Purpose:

This Budget Code includes costs of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas and related liquids removed from Honor Rancho Field during withdrawal operations. Some examples of the type of equipment included in this area are dehydration systems, coolers, vessels, tanks, scrubbers, boilers, pumps, and associated valves, piping, power, and instrumentation. This project provides for multiple, smaller projects not qualifying for separate work papers.

Southern California Gas Company
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Capital Workpapers

Physical Description:

Perform necessary installations, replacements, relocations and upgrades at Honor Rancho Storage Field to address safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required capacities and specifications of various purification systems. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This includes smaller projects not qualifying for individual work papers. The smaller projects will vary from tens of thousands to \$2.5M

Project Justification:

This series of Budget Codes provide for expenditures associated with the cost of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas delivered to or removed from Honor Storage Field. Some examples of the type of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power, and instrumentation.

Witness: Larry Bittleston
Budget Code: 00414.003
Category: A. PURIFICATION
Category Sub: LG PURIFICATION

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$35	\$6	\$8
Non-Labor	Zero-Based	\$1,777	\$646	\$19
NSE	Zero-Based			
Total		\$1,813	\$652	\$27
FTE	Zero-Based	0.4	0.1	0.1

Business Purpose:

This Budget Code includes costs of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas and related liquids removed from La Goleta Storage Field during withdrawal operations. Some examples of the type of equipment included in this area are dehydration systems, coolers, vessels, tanks, scrubbers, boilers, pumps, and associated valves, piping, power, and instrumentation. This project provides for multiple, smaller projects not qualifying for separate work papers.

Physical Description:

Perform necessary installations, replacements, relocations and upgrades at La Goleta Storage Field to address safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required capacities and specifications of various purification systems. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate includes smaller projects not qualifying for individual work papers

Southern California Gas Company
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and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Larger Projects:

- GOL-Compressors Air Fuel Control Sys, 2022-2024 Forecast: \$2.7M (\$2.0M 2022 + \$0.7M 2023)

The objective of this project is the replacement of the Air Fuel Ratio Controllers (AFRC) on the engines powering Main Units 2-8. The existing Woodward GECO units and the associated instrumentation will be replaced with new Woodward E6 controllers. This will include modifications to increase the fuel supply pressure from inches of water to 5-10 psig and adding a coalescer to remove any liquid carried over by the fuel gas. The existing GECO units AFRC is obsolete and is no longer manufactured, nor supported by the OEM. A new, updated AFRC is required to meet regulatory compliance and ensure the reliability and longevity of asset

Project Justification:

This series of Budget Codes provide for expenditures associated with the cost of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas delivered to or removed from La Goleta Storage Field. Some examples of the type of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power, and instrumentation.

Witness: Larry Bittleston
Budget Code: 00414.004
Category: A. PURIFICATION
Category Sub: PDR PURIFICATION

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$369	\$41	\$47
Non-Labor	Zero-Based	\$4,810	\$3,218	\$2,274
NSE	Zero-Based			
Total		\$5,179	\$3,259	\$2,321
FTE	Zero-Based	2.2	0.3	0.2

Business Purpose:

This Budget Code includes costs of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas and related liquids removed from Playa Del Ray Field during withdrawal operations. Some examples of the type of equipment included in this area are dehydration systems, coolers, vessels, tanks, scrubbers, boilers, pumps, and associated valves, piping, power, and instrumentation. This project provides for multiple, smaller projects not qualifying for separate work papers.

Physical Description:

Perform necessary installations, replacements, relocations and upgrades at La Goleta Storage Field to address safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required capacities and specifications of various purification systems. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This estimate includes smaller projects not qualifying for individual work papers and the following larger projects (>\$2.5M). The smaller projects will vary from tens of thousands to \$2.5M.

Larger Projects:

- 93192 - PDR LP Gas H2S Treating Supplemental P1, 2022-2024 Forecast: \$3.2M (\$2.5M 2022 + \$0.7M 2023)

The objective of this project is to replace the existing H2S removal system to match the increase in low pressure gas flowrate at the Playa Del Rey Tank Farm, and improve the H2S gas scrubbing technology. The current solid H2S scavenging system shall be replaced with liquid H2S scavenging system. The H2S scavenging system design capacity shall be upgraded from 0.2 MMSCFD to 1.5 MMSCFD. The proposed new locations for the H2S removal system are within the tank farm, with three (3) potential locations: 1) V-10 current location or 2) V-2B current location, or 3) within the containment area near TK-12. The current system is undersized by flow constraint and needs to be increased in size to accommodate expansion for planned future permanent wet gas compressors installment. Existing solid scavenging system is comprised of large vertical vessels and increasing throughput will create a new need for either larger vessels or more vessels, both of which will become a public relations concern due to expanded footprint. Solid scavenging system replacement is labor intensive process. Disposal of solid scavenger is treated as hazardous solid waste and not able to be shipped out in bulk. Solids removed are manually stored in steel drums and then drums are shipped on flatbed trailer out of state for disposal leading to additional high costs associated with change out. Liquid scavenging system encompasses a smaller footprint within existing tank farm area. Spent liquid can be disposed with crude oil production and will not increase O&M costs due to disposal, O&M costs will be impacted by cost of scavenging chemicals.

- PDR - WD Gas Separator Enhancement, 2022-2024 Forecast: \$3.0M (\$1.0M 2022 + 1.0M 2023 + 1.0M 2024)

This project will install new Separator with increased WD Gas handling capacity. The Facility is currently operating with a limited capacity for handling the WD Gas. Without installation of a new Separator to enhance the WD Gas handling capacity, the Station may potentially stand to lost opportunities to process larger production throughput for WD Gas during peak demand seasons.

Project Justification:

This series of Budget Codes provide for expenditures associated with the cost of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas delivered to or removed from Playa Del Ray Storage Field. Some examples of the type of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power, and instrumentation.

Southern California Gas Company
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Capital Workpapers

Witness: Larry Bittleston
Budget Code: 00414.005
Category: A. PURIFICATION
Category Sub: ALL FIELDS PURIFICATION

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$12	\$414	\$394
Non-Labor	Zero-Based	\$78	\$2,891	\$8,368
NSE	Zero-Based			
Total		\$89	\$3,305	\$8,762
FTE	Zero-Based	0.2	2.7	2,8

Business Purpose:

This Budget Code includes costs of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas and related liquids removed from various storage fields' withdrawal operations. Some examples of the type of equipment included in this area are dehydration systems, coolers, vessels, tanks, scrubbers, boilers, pumps, and associated valves, piping, power, and instrumentation. This project provides for multiple, smaller projects not qualifying for separate work papers.

Physical Description:

Perform necessary installations, replacements, relocations and upgrades at various storage fields' to address safety, maintain or improve reliability, meet regulatory and environmental requirements, and to meet the required capacities and specifications of various purification systems. Projects represented here may vary from as low as a few thousand dollars to as high as several hundreds of thousands of dollars. This includes smaller projects not qualifying for individual work papers. The smaller projects will vary from tens of thousands to \$2.5M

Project Justification:

This series of Budget Codes provide for expenditures associated with the cost of equipment used primarily for the removal of impurities from, or the conditioning of, natural gas delivered to or removed from various storage fields. Some examples of the type of equipment included in this area are dehydrators, coolers, scrubbers, boilers, pumps, valves, piping, power, and instrumentation.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Category: E. Storage Auxillary Equipment & Infrastructure
 Workpaper: 004190

Summary for Category: E. Storage Auxillary Equipment & Infrastructure

	In 2021\$ (000)			
	Adjusted-Recorded	Adjusted-Forecast		
	2021	2022	2023	2024
Labor	2,926	2,240	2,049	2,289
Non-Labor	42,821	62,532	53,585	31,669
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	45,747	64,772	55,634	33,958
FTE	25.7	17.0	17.5	16.0

004190 GAS STOR Aux Equip & Infrastr

Labor	2,926	2,240	2,049	2,289
Non-Labor	42,821	62,532	53,585	31,669
NSE	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total	45,747	64,772	55,634	33,958
FTE	25.7	17.0	17.5	16.0

Note: Totals may include rounding differences.

Beginning of Workpaper Group
004190 - GAS STOR Aux Equip & Infrastr

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr

Summary of Results (Constant 2021 \$ in 000s):

Forecast Method		Adjusted Recorded					Adjusted Forecast		
		2017	2018	2019	2020	2021	2022	2023	2024
	Years								
Labor	Zero-Based	2,899	2,521	2,039	2,556	2,926	2,240	2,049	2,289
Non-Labor	Zero-Based	22,506	24,606	15,249	45,069	42,821	62,532	53,585	31,669
NSE	Zero-Based	0	0	0	0	0	0	0	0
	Total	25,404	27,128	17,288	47,625	45,747	64,772	55,634	33,958
FTE	Zero-Based	19.9	18.7	14.7	19.3	25.7	17.0	17.5	16.0

Business Purpose:

This forecast includes costs of miscellaneous capital work in the storage fields to maintain, replace, relocate, and upgrade the various systems throughout the storage fields.

Physical Description:

Perform necessary replacements, installations, relocations, and upgrades at Storage Field to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required functions of the various systems. Includes work on various types of fields equipment such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems.

Project Justification:

This type of work related to operation the required functions of the various systems is essential to Storage Field safety.

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00419.0
Category: E. Storage Auxillary Equipment & Infrastructure
Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr

Forecast Methodology:

Labor - Zero-Based

Due to the annual variability of capital maintenance required, a zero-based methodology was used to develop the estimate. It is based on both on-site field personnel and business support related to Gas Storage operations and projects.

Non-Labor - Zero-Based

Due to the variability in work associated with Gas Storage operations forecasts used a zero-based methodology. The forecast is based on knowledge of experienced personnel at the storage fields and quotes for necessary materials and equipment.

NSE - Zero-Based

none

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr

Summary of Adjustments to Forecast

In 2021 \$ (000)										
Forecast Method		Base Forecast			Forecast Adjustments			Adjusted-Forecast		
Years		2022	2023	2024	2022	2023	2024	2022	2023	2024
Labor	Zero-Based	2,240	2,049	2,289	0	0	0	2,240	2,049	2,289
Non-Labor	Zero-Based	62,532	53,585	31,669	0	0	0	62,532	53,585	31,669
NSE	Zero-Based	0	0	0	0	0	0	0	0	0
Total		64,772	55,634	33,958	0	0	0	64,772	55,634	33,958
FTE	Zero-Based	17.0	17.5	16.0	0.0	0.0	0.0	17.0	17.5	16.0

Forecast Adjustment Details

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2022 Total	0	0	0	0	0.0
2023 Total	0	0	0	0	0.0
2024 Total	0	0	0	0	0.0

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
Witness: Lawrence T. Bittleston
Budget Code: 00419.0
Category: E. Storage Auxillary Equipment & Infrastructure
Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr

Determination of Adjusted-Recorded:

	2017 (\$000)	2018 (\$000)	2019 (\$000)	2020 (\$000)	2021 (\$000)
Recorded (Nominal \$)*					
Labor	1,849	1,705	1,419	1,889	2,487
Non-Labor	16,678	20,067	12,803	40,281	42,981
NSE	0	0	0	0	0
Total	18,527	21,772	14,222	42,171	45,468
FTE	16.9	15.9	12.3	16.1	21.5
Adjustments (Nominal \$)**					
Labor	0	-5	0	0	0
Non-Labor	116	-621	-177	-1,103	-160
NSE	0	0	0	0	0
Total	116	-626	-177	-1,103	-160
FTE	0.0	-0.1	0.0	0.0	0.1
Recorded-Adjusted (Nominal \$)					
Labor	1,849	1,700	1,419	1,889	2,487
Non-Labor	16,794	19,446	12,626	39,178	42,821
NSE	0	0	0	0	0
Total	18,643	21,147	14,045	41,067	45,308
FTE	16.9	15.8	12.3	16.1	21.6
Vacation & Sick (Nominal \$)					
Labor	313	293	269	333	439
Non-Labor	0	0	0	0	0
NSE	0	0	0	0	0
Total	313	293	269	333	439
FTE	3.0	2.9	2.4	3.2	4.1
Escalation to 2021\$					
Labor	736	529	351	334	0
Non-Labor	5,712	5,160	2,623	5,890	0
NSE	0	0	0	0	0
Total	6,448	5,689	2,973	6,225	0
FTE	0.0	0.0	0.0	0.0	0.0
Recorded-Adjusted (Constant 2021\$)					
Labor	2,899	2,521	2,039	2,556	2,926
Non-Labor	22,506	24,606	15,249	45,069	42,821
NSE	0	0	0	0	0
Total	25,404	27,128	17,288	47,625	45,747
FTE	19.9	18.7	14.7	19.3	25.7

* 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
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr

Summary of Adjustments to Recorded:

In Nominal \$(000)					
Years	2017	2018	2019	2020	2021
Labor	0	-5	0	0	0
Non-Labor	116	-621	-177	-1,103	-160
NSE	0	0	0	0	0
Total	116	-626	-177	-1,103	-160
FTE	0.0	-0.1	0.0	0.0	0.1

Detail of Adjustments to Recorded in Nominal \$:

Year	Labor	NLbr	NSE	Total	FTE
2017	0	69	0	69	0.0
Explanation:	To transfer costs under BC 410 IO 300782709 LG-STATION ABOVE GROUND SAFETY ENHANMT to 419 work paper group				
2017	0	47	0	47	0.0
Explanation:	Transfer Gas Engineering non-labor costs of \$46,762 associated with office facility work from BC 06220 cost center 2200-0279 in workpaper group 006220 E Construction/Alteration – Buildings – New Additions to BC00419G 2200-0279 in work paper group BC004190 to align costs where UGS function resides.				
2017 Total	0	116	0	116	0.0
2018	0	37	0	37	0.0
Explanation:	To transfer costs under BC 410 IO 300782709 LG-STATION ABOVE GROUND SAFETY ENHANMT to 419 work paper group				
2018	-5	-658	0	-663	-0.1
Explanation:	Incremental costs that are anticipated to be requested for recovery through a non-GRC Catastrophic Event Memorandum Account (CEMA).				
2018 Total	-5	-621	0	-626	-0.1
2019	0	24	0	24	0.0
Explanation:	To transfer costs under BC 410 IO 300782709 LG-STATION ABOVE GROUND SAFETY ENHANMT to 419 work paper group.				
2019	0	-201	0	-201	0.0
Explanation:	Incremental costs that are anticipated to be requested for recovery through a non-GRC Catastrophic Event Memorandum Account (CEMA).				
2019 Total	0	-177	0	-177	0.0
2020	0	45	0	45	0.0
Explanation:	To transfer costs under BC 410 IO 300782709 LG-STATION ABOVE GROUND SAFETY ENHANMT to 419 work paper group.				

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr

<u>Year</u>	<u>Labor</u>	<u>NLbr</u>	<u>NSE</u>	<u>Total</u>	<u>FTE</u>
2020	0	-1,149	0	-1,149	0.0
Explanation:	Incremental costs that are anticipated to be requested for recovery through a non-GRC Catastrophic Event Memorandum Account (CEMA).				
2020 Total	0	-1,103	0	-1,103	0.0
2021	0	-610	0	-610	0.0
Explanation:	Incremental costs that are anticipated to be requested for recovery through a non-GRC Catastrophic Event Memorandum Account (CEMA).				
2021	0.084	103	0	103	0.1
Explanation:	Costs were incurred by Storage for base capital activities.				
2021	0	347	0	347	0.0
Explanation:	To add material costs (6215567, 6215568) that were misclassified as indirect.				
2021 Total	0.084	-160	0	-160	0.1

Note: Totals may include rounding differences.

**Beginning of Workpaper Sub Details for
Workpaper Group 004190**

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.001 - STORAGE AUX. EQUIPMENT & INFRASTRUCTURE - Aliso Canyon
 In-Service Date: Not Applicable
 Description:

AC projects Storage Aux Equip

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		213	31	12
Non-Labor		15,717	12,401	8,419
NSE		0	0	0
	Total	15,930	12,432	8,431
FTE		1.7	0.2	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.002 - STORAGE AUX EQUIPMENT & INFRASTRUCTURE - Honor Rancho
 In-Service Date: Not Applicable

Description:

HR Projects Storage Aux Equip

Forecast In 2021 \$(000)				
	Years	<u>2022</u>	<u>2023</u>	<u>2024</u>
Labor		11	13	1
Non-Labor		8,085	4,883	3,446
NSE		0	0	0
	Total	<u>8,096</u>	<u>4,896</u>	<u>3,447</u>
FTE		0.1	0.1	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.003 - STORAGE AUX EQUIPMENT & INFRASTRUCTURE - PDR
 In-Service Date: Not Applicable

Description:

PDR Projects Storage Aux Equip

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		8	6	8
Non-Labor		5,899	3,861	1,957
NSE		0	0	0
	Total	5,907	3,867	1,965
FTE		0.1	0.1	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.004 - STORAGE AUX EQUIPMENT & INFRASTRUCTURE - LG
 In-Service Date: Not Applicable

Description:

LG Projects - Storage Aux Equip

Forecast In 2021 \$(000)				
	Years	<u>2022</u>	<u>2023</u>	<u>2024</u>
Labor		2	1	15
Non-Labor		6,092	7,798	978
NSE		0	0	0
	Total	<u>6,094</u>	<u>7,799</u>	<u>993</u>
FTE		0.1	0.1	0.1

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.005 - Storage Aux Equipment - All Storage Fields
 In-Service Date: 05/31/2024

Description:

All Storage Fields projects - Storage Aux Equip

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		446	435	1,528
Non-Labor		2,015	2,159	12,086
NSE		0	0	0
	Total	2,461	2,594	13,614
FTE		7.6	9.8	12.7

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.006 - AC RECLAIM Lean Burn
 In-Service Date: 05/31/2024

Description:

AC RECLAIM Lean Burn Major Projects

Forecast In 2021 \$(000)				
	Years	<u>2022</u>	<u>2023</u>	<u>2024</u>
Labor		359	456	309
Non-Labor		4,387	9,235	2,784
NSE		0	0	0
	Total	<u>4,746</u>	<u>9,691</u>	<u>3,093</u>
FTE		2.7	2.8	1.4

Note: Totals may include rounding differences.

Southern California Gas Company
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 Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.007 - AC RECLAIM Rich Burn
 In-Service Date: 06/30/2023

Description:

AC RECLAIM Rich Burn under Major Projects Group

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		234	66	0
Non-Labor		2,635	2,123	0
NSE		0	0	0
	Total	2,869	2,189	0
FTE		1.2	0.3	0.0

Note: Totals may include rounding differences.

Southern California Gas Company
2024 GRC - REVISED
Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.008 - HR RECLAIM
 In-Service Date: 03/31/2023

Description:

HR RECLAIM project under Major Construction

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		585	512	0
Non-Labor		4,018	341	0
NSE		0	0	0
	Total	4,603	853	0
FTE		2.0	2.0	0.0

Note: Totals may include rounding differences.

Southern California Gas Company
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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.010 - PDR RECLAIM
 In-Service Date: 02/29/2024
 Description:

PDR RECLAIM under Major Projects

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		340	529	416
Non-Labor		11,661	10,784	1,999
NSE		0	0	0
	Total	12,001	11,313	2,415
FTE		1.4	2.1	1.5

Note: Totals may include rounding differences.

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Capital Workpapers

Area: GAS STORAGE
 Witness: Lawrence T. Bittleston
 Budget Code: 00419.0
 Category: E. Storage Auxillary Equipment & Infrastructure
 Category-Sub: 1. Storage Auxillary Equipment & Infrastructure
 Workpaper Group: 004190 - GAS STOR Aux Equip & Infrastr
 Workpaper Detail: 004190.012 - AC P30 Isolation Valve Replacement
 In-Service Date: 05/31/2022

Description:

AC P30 isolation Valve Replacement project under Major Projects

Forecast In 2021 \$(000)				
	Years	2022	2023	2024
Labor		42	0	0
Non-Labor		2,023	0	0
NSE		0	0	0
	Total	2,065	0	0
FTE		0.1	0.0	0.0

Note: Totals may include rounding differences.

Supplemental Workpapers for Workpaper Group 004190

Southern California Gas Company
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Capital Workpapers

Witness: Larry Bittleston/Steve Hruby
Budget Code: 00419.000
Category: A. Auxillary Equipment

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$2,240	\$2,049	\$2,289
Non-Labor	Zero-Based	\$62,532	\$53,585	\$31,669
NSE	Zero-Based			
Total		\$64,772	\$55,634	\$33,958
FTE	Zero-Based	17.0	17.5	16.0

Witness: Larry Bittleston
Budget Code: 00419.001
Category: A. AUXILLIARY EQUIPMENT
Category Sub: AUXILLIARY EQUIPMENT- AC

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$213	\$31	\$12
Non-Labor	Zero-Based	\$15,717	\$12,401	\$8,419
NSE	Zero-Based			
Total		\$15,930	\$12,432	\$8,431
FTE	Zero-Based	1.7	0.2	0.1

Business Purpose:

This Budget Code includes costs of miscellaneous capital work in the Aliso Canyon Storage Field to maintain, replace, relocate, and upgrade the various systems throughout the storage field.

Physical Description:

Perform necessary replacements, installations, relocations, and upgrades at Aliso Canyon Storage Field to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required functions of the various systems. Includes work on various types of fields equipment not captured under budget categories 411, 412, or 414 such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. This estimate will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$3.5M). The smaller projects will vary from tens of thousands to \$3.5M.

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Capital Workpapers

Larger Projects:

- AC - Fuel Cell, 2022-2024 Forecast, 2022-2024 Forecast: \$12.1M (\$0.9M 2022 + \$10.7M 2023 + \$0.5M 2024) Planning, feasibility studies, detailed scope development, preliminary engineering and design, and request for proposals, Development for detailed engineering and construction for a Fuel Cell project at Aliso Canyon. The storage facility will be able to utilize the Fuel Cells, a source of cleaner power production, as the primary power source for the station and have the existing genset units or SCE grid power as back-ups.

Project Justification:

This Budget Category provides funding for work on various types of field equipment not captured in other Storage Budget Categories, such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. If these auxiliary systems fail to operate at required design levels, the company's ability to safely and efficiently deliver gas to our customers may be compromised.

Witness: Larry Bittleston
Budget Code: 00419.002
Category: A. AUXILLIARY EQUIPMENT
Category Sub: AUXILLIARY EQUIPMENT– HR

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$11	\$13	\$1
Non-Labor	Zero-Based	\$8,085	\$4,883	\$3,446
NSE	Zero-Based			
Total		\$8,096	\$4,896	\$3,447
FTE	Zero-Based	0.1	0.1	0.1

Business Purpose:

This Budget Code includes costs of miscellaneous capital work in the Honor Rancho Storage Field to maintain, replace, relocate, and upgrade the various systems throughout the storage field.

Physical Description:

Perform necessary replacements, installations, relocations, and upgrades at Honor Rancho Storage Field to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required functions of the various systems. Includes work on various types of fields equipment not captured under budget categories 411, 412, or 414 such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems,

Southern California Gas Company
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Capital Workpapers

electrical, drainage, infrastructure, transportation, safety, and communications systems. Forecasted amounts do not include several line-item projects shown on other work papers in this Budget Code. This estimate will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$3.5M). The smaller projects will vary from tens of thousands to \$3.5M.

Larger Projects:

- 93005 - HR - Motor Control Upgrade PH1, 2022-2024 Forecast: \$5.5M
Develop scope in support of upgrading motor control centers to enhance the reliability of the Electrical System. Initial phase is to install Current Transformers (CT's) for improved monitoring of generator output. This will improve reliability of generator operation.
- HR – Electrical Pole Hardening, 2022-2024 Forecast: \$4.1M
Overhead power system will be upgraded with steel poles and hardened system and power line design to meet existing environmental conditions. This project will provide Honor Rancho Storage Field with and overhead power system that meets existing environmental conditions required under CPUC GO95. The hardening will increased the overhead reliability, mitigate equipment & personnel damage, and mitigate fire risks.
- HR- Operations Center Modernization, 2022-2024 Forecast: \$3.6M
The project includes modernization of control room displays, communication equipment and building renovation. Modernization will be designed to allow for full operation meetings, updated facilities and communication with operating equipment. The new control room will Station personnel to remotely monitor new and updated field equipment. The control room upgrade will expand work space to accommodate for centralized work spaces.

Project Justification:

This Budget Category provides funding for work on various types of field equipment not captured in other Storage Budget Categories, such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. If these auxiliary systems fail to operate at required design levels, the company's ability to safely and efficiently deliver gas to our customers may be compromised.

Witness: Larry Bittleston
Budget Code: 00419.003
Category: A. AUXILLIARY EQUIPMENT
Category Sub: AUXILLIARY EQUIPMENT– PDR

Forecast Method		Forecast		
Constant 2021 \$ in 000s		2022	2023	2024
Labor	Zero-Based	\$8	\$6	\$8
Non-Labor	Zero-Based	\$5,899	\$3,861	\$1,957
NSE	Zero-Based			
Total		\$5,907	\$3,867	\$1,965
FTE	Zero-Based	0.1	0.1	0.1

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Business Purpose:

This Budget Code includes costs of miscellaneous capital work in the Playa Del Ray Storage Field to maintain, replace, relocate, and upgrade the various systems throughout the storage field.

Physical Description:

Perform necessary replacements, installations, relocations, and upgrades at Playa Del Ray Storage Field to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required functions of the various systems. Includes work on various types of fields equipment not captured under budget categories 411, 412, or 414 such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. Forecasted amounts do not include several line-item projects shown on other work papers in this Budget Code. This estimate will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$3.5M). The smaller projects will vary from tens of thousands to \$3.5M.

Larger Projects:

92401 - PDR-Relocate Pipes to Pipe, 2022-2024 Forecast: \$3.5M

Engineering and design to relocate or install new pipeline on existing pipe bridge. Scope will also include installing and rerouting fire protection lines. Existing pipe supports are not engineered to current structural code.

Project Justification:

This Budget Category provides funding for work on various types of field equipment not captured in other Storage Budget Categories, such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. If these auxiliary systems fail to operate at required design levels, the company's ability to safely and efficiently deliver gas to our customers may be compromised.

Witness: Larry Bittleston
Budget Code: 00419.004
Category: A. AUXILLIARY EQUIPMENT
Category Sub: AUXILLIARY EQUIPMENT– LG

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$2	\$1	\$15
Non-Labor	Zero-Based	\$6,092	\$7,798	\$978
NSE	Zero-Based			
Total		\$6,094	\$7,799	\$993
FTE	Zero-Based	0.1	0.1	0.1

Business Purpose:

This Budget Code includes costs of miscellaneous capital work in the La Goleta Storage Field to maintain, replace, relocate, and upgrade the various systems throughout the storage field.

Physical Description:

Perform necessary replacements, installations, relocations, and upgrades at La Goleta Storage Field to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required functions of the various systems. Includes work on various types of fields equipment not captured under budget categories 411, 412, or 414 such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. Forecasted amounts do not include several line-item projects shown on other work papers in this Budget Code.

This estimate will be accomplished via smaller projects not qualifying for individual work papers and the following larger projects (>\$3.5M). The smaller projects will vary from tens of thousands to \$3.5M.

Larger Projects:

- GOL- Atascadero Bridge Crossing, 2022-2024 Forecast: \$4.4M
Install a new 250-foot long, 12-foot wide pre-fabricated bridge across the creek to provide light vehicle access and a consolidated SCE electrical feed across to the Miller Sites. The bridge will be designed to carry utility terrain vehicles and light trucks (<20,000 lbs.) across the creek for both emergency egress and maintenance access that otherwise requires the use of Highway 217 through town.
- LG- Baseline Turbine Generator, 2022-2024 Forecast: \$3.8M
Design and Engineer for the installation of a new Microturbine system. Start permitting and Environmental Process in coordination with Engineering. Improve Reliability. Existing Capstone capacity cannot support future near term additional loads without impacting the station's local generation reserve philosophy.

Project Justification:

This Budget Category provides funding for work on various types of field equipment not captured in other Storage Budget Categories, such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. If these auxiliary systems fail to operate at required design levels, the company's ability to safely and efficiently deliver gas to our customers may be compromised.

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Witness: Larry Bittleston
 Budget Code: 00419.005
 Category: A. AUXILLIARY EQUIPMENT
 Category Sub: AUXILLIARY EQUIPMENT– ALL FIELDS

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$446	\$435	\$1,528
Non-Labor	Zero-Based	\$2,015	\$2,195	\$12,086
NSE	Zero-Based			
Total		\$2,461	\$2,594	\$13,614
FTE	Zero-Based	7.6	8.8	11.7

Business Purpose:

This Budget Code includes costs of miscellaneous capital work in various storage fields to maintain, replace, relocate, and upgrade the various systems throughout the storage field.

Physical Description:

Perform necessary replacements, installations, relocations, and upgrades at various storage fields to ensure safety, maintain or improve reliability, meet regulatory and environmental requirements and to meet the required functions of the various systems. Includes work on various types of fields equipment not captured under budget categories 411, 412, or 414 such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. Forecasted amounts do not include several line-item projects shown on other work papers in this Budget Code.

Project Justification:

This Budget Category provides funding for work on various types of field equipment not captured in other Storage Budget Categories, such as instrumentation, controls, auxiliary equipment, generators, air compressors, odorization systems, electrical, drainage, infrastructure, transportation, safety, and communications systems. If these auxiliary systems fail to operate at required design levels, the company's ability to safely and efficiently deliver gas to our customers may be compromised.

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Witness: Steve Hruby
Budget Code: 00419.006
Category: A. Auxillary Equipment
Category Sub: AC Reclaim Lean Burn

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$359	\$456	\$309
Non-Labor	Zero-Based	\$4,387	\$9,235	\$2,784
NSE	Zero-Based			
Total		\$4,746	\$9,691	\$3,093
FTE	Zero-Based	2.7	2.9	1.4

Business Purpose:

The purpose of the Aliso Canyon RECLAIM Lean Burn Project is to comply with the new South Coast Air Quality Management District (South Coast AQMD) compliance requirements of Rule 1110.2 "Emissions from Gaseous and Liquid Fueled Engines" and 1100 "Implementation Schedule for NOx Facilities" associated with the sunset of the nitrogen oxides (NOx) RECLAIM program.

Physical Description:

Aliso Canyon RECLAIM Lean Burn Project will retrofit the five existing compressor gas lean-burn engines with state-of-the art emission control systems and replace the existing oxidation catalysts that control CO and VOC with dual function catalysts to control NOx in addition to CO and VOC emissions.

Project Justification:

Aliso Canyon RECLAIM Lean Burn Project modifications will allow compliance to SCAQMD Rule 1110.2 and 1100 while reducing NOx, CO and VOC emissions to 11, 250 and 30 parts per million (ppmvd) at 15% oxygen, respectively.

Witness: Steve Hruby
Budget Code: 00419.007
Category: A. Auxillary Equipment

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$234	\$66	\$0

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Non-Labor	Zero-Based	\$2,635	\$2,123	\$0
NSE	Zero-Based			
Total		\$2,869	\$2,189	\$0
FTE	Zero-Based	1.2	0.3	0.0

Category Sub:
AC
Reclaim Rich
Burn

Business Purpose:

The purpose of the Aliso Canyon RECLAIM Rich Burn Project is to comply with the new South Coast Air Quality Management District (South Coast AQMD) compliance requirements of Rule 1110.2 “Emissions from Gaseous and Liquid Fueled Engines” and 1100 “Implementation Schedule for NOx Facilities” associated with the sunset of the nitrogen oxides (NOx) RECLAIM program.

Physical Description:

The Aliso Canyon RECLAIM Rich Burn Scope includes:

- Replacement in-kind of four (4) generator engines oxidation catalyst and housings.
- Install four (4) new rich burn engine analyzers and supporting systems in new CEMS enclosure.
- Route heated exhaust gas sampling lines from engine stacks to the analyzers in the CEMS enclosure.
- Install support structures and platforms for access to new equipment and connections.

Project Justification:

Aliso Canyon RECLAIM Rich Burn Project modifications will allow compliance to SCAQMD Rule 1110.2 and 1100 while reducing NOx, CO and VOC emissions to 11, 250 and 30 parts per million (ppmvd) at 15% oxygen, respectively.

Witness: Steve Hruby
Budget Code: 00419.008
Category: A. Auxillary Equipment
Category Sub: HR RECLAIM

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$585	\$513	\$0
Non-Labor	Zero-Based	\$4,018	\$341	\$0
NSE	Zero-Based			
Total		\$4,603	\$854	\$0
FTE	Zero-Based	2.0	2.0	0.0

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Business Purpose:

The purpose of the Honor Rancho RECLAIM Project is to comply with the new South Coast Air Quality Management District (South Coast AQMD) compliance requirements of Rule 1110.2 “Emissions from Gaseous and Liquid Fueled Engines” and 1100 “Implementation Schedule for NOx Facilities” associated with the sunset of the nitrogen oxides (NOx) RECLAIM program.

Physical Description:

Honor Rancho RECLAIM Project Scope includes:

1) For two (2) wet gas compressor engines:

- Replacement in-kind of catalyst and housing with new in-kind housing.
- Re-tune the existing air fuel ratio controller (AFRC).

2) For three (3) generator engines:

- Replace existing catalyst housing with new in-kind housing.
- Install a new air fuel ration controller (AFRC).
- Install new continuous emission monitoring system (CEMS) for monitoring NOx, CO and O2 in enclosure.
- Modify exhaust stacks to add sampling connections and route heated exhaust gas sampling lines from engine stacks to the analyzers in the CEMS enclosure.

Project Justification:

Honor Rancho RECLAIM Project modifications will allow compliance to SCAQMD Rule 1110.2 and 1100 while reducing NOx, CO and VOC emissions to 11, 250 and 30 parts per million (ppmvd) at 15% oxygen, respectively.

Witness: Steve Hruby
 Budget Code: 00419.010
 Category: A. Auxillary Equipment
 Category Sub: PDR RECLAIM

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$340	\$528	\$415
Non-Labor	Zero-Based	\$11,661	\$10,784	\$1,999
NSE	Zero-Based			
Total		\$12,001	\$11,312	\$2,414
FTE	Zero-Based	1.4	2.1	1.5

Business Purpose:

The purpose of the Playa Del Rey RECLAIM Project is to comply with the new South Coast Air Quality Management District (South Coast AQMD) compliance requirements of Rule 1110.2 "Emissions from Gaseous and Liquid Fueled Engines" and 1100 "Implementation Schedule for NOx Facilities" associated with the sunset of the nitrogen oxides (NOx) RECLAIM program.

Physical Description:

The Playa del Rey RECLAIM Project scope can be summarized as:

- Install combustion stabilization systems comprised of engine model predictive control, trapped equivalence ratio (TER) control, electronic pre-combustion check (EPCC) valves, high-pressure fuel injection (Hyperfuel™), and re-worked engine turbos.
- Replace foundations for two (2) compressors as part of combustion stabilization to comply safe continuous future operation.
- Install post combustion treatment system three (3) engine exhausts comprising of new SCR system with new housing and replacement of existing oxidation catalyst in-kind with new housing.
- Install new aqueous urea 6000-gallon storage system and urea injection systems for SCR system.
- Install new CEMS system with enclosure to monitor lower NOx concentrations and to meet the requirements of SCAQMD Rules.
- Route heated exhaust gas sampling lines from engine exhaust to the analyzers in the CEMS enclosure.
- Replace utility air compressor and the starting air compressor with new electric motor driven units to meet updated air demands.

Project Justification:

Playa del Rey Project modifications will allow compliance to SCAQMD Rule 1110.2 and 1100.

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Witness: Steve Hruby
 Budget Code: 00419.012
 Category: A. Auxillary Equipment
 Category Sub: AC – P30 Isolation Valve Replacement

Forecast Method		Forecast		
<i>Constant 2021 \$ in 000s</i>		2022	2023	2024
Labor	Zero-Based	\$42	\$0	\$0
Non-Labor	Zero-Based	\$2,023	\$0	\$0
NSE	Zero-Based			
Total		\$2,065	\$0	\$0
FTE	Zero-Based	0.1	0.0	0.0

Business Purpose:

Aliso Canyon P30 Isolation Valve Replacement Project will facilitate isolation of critical gas and waste liquid pipelines to prevent gas and/or oily liquid release in the canyon area during landslides and soil erosion risk conditions.

Physical Description:

Aliso Canyon P30 Isolation Valve Replacement Project will install isolation valves at P30, where the pipes enter the canyon and at FF38, where the pipes exit the canyon to provide pipeline isolation.

Project Justification:

Aliso Canyon P30 Isolation Valve Replacement Project will enhance safety by mitigating risks associated with landslides and erosion.