Company: Southern California Gas Company (U 904 G)
Proceeding: 2024 General Rate Case
Application: A.22-05-015
Exhibit: SCG-07-R

REVISED

PREPARED DIRECT TESTIMONY OF MARIA T. MARTINEZ (GAS ENGINEERING)

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

August 2022

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Southern California Gas Company
Test Year 2024 Summary of Total Costs

GAS ENGINEERING (in 2021 $, in 000s)			
	2021 Adjusted-Recorded	**TY2024 Estimated**	**Change**
Total Non-Shared Services	15,488	16,445	957
Total Shared Services (Incurred)	14,678	16,598	1,920
Total O&M	**30,166**	**33,043**	**2,877**

GAS ENGINEERING (in 2021 $, in 000s)				
	2021 Adjusted-Recorded	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
Total CAPITAL	**21,179**	**18,953**	**18,033**	**24,153**

The purpose of Gas Engineering is (1) to establish and oversee the engineering aspects of the gas infrastructure[1] for satisfying federal and state environmental and safety requirements; (2) implement industry best practices; and (3) optimize infrastructure and end-use equipment performance for Southern California Gas Company (SoCalGas) and San Diego Gas and Electric (SDG&E). Gas Engineering supports all groups within SoCalGas that need engineering support or guidance related to the gas infrastructure or end-use equipment including but not limited to the key operating groups such as Transmission, Distribution, Storage, and Customer Services. Gas Engineering provides engineering programs, training, guidance, policies, designs, and data analytics focused on providing safe, compliant, reliable, resilient, and cost-effective energy infrastructure for both SoCalGas and SDG&E. Gas Engineering also manages the Land and Right of Way function and related capital for SoCalGas. Gas Engineering provides technical and engineering support and oversight to various groups at SoCalGas. The department establishes programs and policies to facilitate compliance with the multitude of state and federal regulations

[1] Gas infrastructure could include, and is not limited to, natural gas, renewable natural gas, hydrogen, CO2, and "all real estate, fixtures, and personal property, owned, controlled, operated, or managed in connection with or to facilitate the production, generation, transmission, delivery, underground, storage, or furnishing of gas, natural or manufactured, except propane, for light, heat, or power." (*See* Pub.Util. Code § 221.)

related to the engineering issues concerning pipe design and appurtenances, compressors, instruments and controls, and other gas facilities. Gas Engineering also performs testing for gas and material quality to validate they meet specifications, regulatory requirements, and contractual obligations.

Gas Engineering's key activities and programs are described in my testimony under the following broad categories:

Analysis, Testing and Materials: This category includes Engineering Analysis Center (EAC) which provides gas quality policy and operating procedures, gas composition, sulfur gas analysis, odorization management and test development, gas line odor seasoning management and training, and gas quality testing including, mobile gas operations test vehicles and fugitive and leakage gas identification and verification. These activities support employee, customer, contractor, and environmental safety through the delivery of natural gas that is detectable and meets quality requirements mitigating undesirable constituents from being transported to customer appliances, machines, or equipment. Over the years, the EAC has expanded to support material traceability and Non-Destructive Examination (NDE) oversight. The NDE team provides oversight of construction projects, focusing on compliance with standards and procedures in the areas of inspection for NDE, Welding and Coating. The development of the Material Quality Management (MQM) team provides overarching engineering policies for the development of material specifications, vendor assessment, material quality requirements, testing of material, and quality audits.

Measurement and Regulation (M&R): This category provides engineering support for gas measurement and regulation policies and design, material specifications, testing and evaluating of gas meter set assemblies (MSAs), Pressure Limiting Stations (PLSs), District Regulator Station (DRSs) equipment and technology, and validating the integrity and capacity of stations across the service territory. Assets managed by this team include small residential installations, large industrial customers such as electric generation plants, critical points of receipt such as Renewable Natural Gas (RNG) interconnectors, and city gates. In addition, this group is also responsible for conducting engineering studies to determine replacement and performance enhancement strategies for installed measurement regulation and control infrastructure, which includes developing best practices to prevent over pressurization of pipelines and gas distribution systems. These activities are core operations functions that require support on a continual basis.

The Measurement Technologies group is responsible for testing, evaluation, selection, and deployment of strategic planning, policies, and practices associated with gas metering equipment, ranging from the smallest residential diaphragm meters to the largest ultrasonic meters and electronic measurement equipment. This work is conducted on behalf of both SDG&E and SoCalGas. This group is also responsible for managing the company's meter and regulator maintenance and inspection scheduling and reporting system, and for providing auditing of company measurement sites to validate compliance with policy and technical specifications. Furthermore, this group is also responsible for conducting engineering studies to determine replacement and performance enhancement strategies for installed measurement infrastructure.

Land and Right-of-Way: The Land and Right-of-Way team manages the necessary property rights that allow for access to, operation, and maintenance of our pipeline infrastructure on public and private properties. In addition, this group administers lease payments of pipeline rights-of-way and manages complex issues related to the extension and renewal of expiring pipeline rights-of-way.

Research, Plastics, and Aviation: This category provides a breadth of activities that ranges from Research, Development, and Demonstration (RD&D) used to assess and demonstrate emerging technology that can mitigate environmental impacts, increase safety, and increase reliability. The funding for RD&D Programs, although managed by Gas Engineering, is requested in Armando Infanzon's Clean Energy Innovations testimony (Ex. SCG-12) and is expanded upon later in my testimony. This team provides technical expertise for plastic piping systems, including material requirements and testing and related operational processes related to the installation of plastic mains and services. The Aviation Services team leverages manned and unmanned (drone) transportation platforms and technology payloads to supplement maintenance inspections within Operations that have been historically challenging to access such as pipe spans, heavily vegetated rights of way, private property Can't-Get-Ins (CGIs), and areas impacted by hazards such as mudslides.

Engineering Design and Management: This category includes teams that support a variety of engineering and design elements including Pipeline Design, Civil, Process Engineering, Mechanical, Electrical, and Instrument and Controls. The engineering and design disciplines are supported by Design Drafting, Project Engineering, and Distribution Engineering.

The Pipeline Design team reviews design data sheets, loading analyses, evaluations of spans, vibration analyses, and stress evaluations related to ground movement. The Civil team is responsible for policies related to geohazards, evaluation of potential hazards and mitigation proposals, structural assessments and design, and on-going evaluation of geohazard related issues such as wildfires, earthquakes, subsidence, and landslides. The Process Engineering team provides technical expertise in process engineering systems and supports the operations and maintenance and design of processing systems and equipment for storage fields and transmission systems. The Mechanical team provides guidance and policies related to mechanical design and technical expertise during project design. The Electrical team provides guidance and policies related to electrical design, and electrical equipment within the various facilities and stations across the service territory. The Instrument and Control (I&C) team is primarily responsible for design, installation, and support of instrumentation, process measurement, and control equipment and systems used across our gas system infrastructure. This equipment is used to process, operate, and monitor large pipeline valves, customer gas measurement facilities, gas compressors, generator engines, wellhead safety systems, natural gas dehydration systems, greenhouse gas (GHG) emissions, and various other stand-alone process variables such as pressure, temperature, level, and vibration sensing.

The Design Drafting, Engineering Information Technology, Project Engineering and Distribution System Engineering teams provide overarching support to the various engineering disciplines. The Design Drafting team provides guidance and policies related to drawing design requirements, deployment of 3D software technology, as-built support, quality, and assurance of construction packages. Engineering Information Technology (EIT) provides strategies for the establishment and utilization of data centric design applications such as intelligent piping and instrumentation diagrams (PIDs) and 3D modeling, and also develops working instructions, workflows, training, data requirements, and asset tagging standards related to those 3D applications. The EIT team's goals are to provide quality and consistency of engineering information to support integration and visualization of data and documents across platforms. The Distribution System Engineering team provides guidance and support to the regional offices located across the service territory to promote consistency and efficiencies in the areas of data management, policy, development, and implementation of emerging technology or tools. The Project Engineering team was recently created to provide increased coordination and oversight of

project execution. The Project Engineering team provides centralized support for engineering design requests related to construction and maintenance projects across Operations and Integrity Management programs. It also supports project execution from initiation to close-out, including development of project scopes, schedules, technical deliverables, and project status reporting. The project engineers provide support to a variety of project types including but not limited to major compressor station modernization, renewable natural gas, control center modernization and traditional Gas Transmission and Gas Storage projects.

Director of Gas Engineering (GE), Vice President of Gas Engineering and System Integrity (SI), and Hydrogen Blending Strategy: This category includes the costs and activities associated with the Vice President of Gas Engineering and System Integrity, Director of Gas Engineering and Hydrogen Blending Strategy team. The expenditures incurred by the Vice President (VP) and Director of Gas Engineering are related to setting the goals and vision for the organization in alignment with company goals, financial support, and administrative functions. These roles provide governance and technical and policy support for the various Operating groups for SoCalGas and SDG&E. For example, the Hydrogen Blending Strategy team is responsible for developing a roadmap to evaluate the ability to blend hydrogen into the system.[2] The roadmap includes research efforts, collaborations with industry partners, potential updates to policies, standards and procedures, and development of pilot projects to validate research findings.

[2] All costs in my testimony, including costs associated with the Hydrogen Blending Strategy, are separate from costs associated with the Angeles Link Project. On February 17, 2022, SoCalGas filed A.22.02.007 with the CPUC to establish the Angeles Link Project Memorandum Account, or ALPMA. As proposed, the ALPMA would track the incremental costs associated with stakeholder engagement and engineering, design, and environmental work necessary to develop Angeles Link, a project enabling the delivery of renewable green hydrogen into the Los Angeles Basin.

REVISED SOCALGAS DIRECT TESTIMONY OF
MARIA T. MARTINEZ
(GAS ENGINEERING)

I. INTRODUCTION

A. Summary of Gas Engineering Costs and Activities

My testimony supports the Test Year (TY) 2024 forecasts for operations and maintenance (O&M) costs for both non-shared and shared services, and capital costs for the forecast years 2022, 2023, and 2024, associated with the Gas Engineering area for SoCalGas and shared services for SDG&E. It should be noted that the broad categories of Analysis, Testing, Materials, Measurement and Regulation, and Research, Plastics, and Aviation have shared, and non-shared costs associated with them and will be presented in both sections, but the activities will be carved out as appropriate.

Table MM-1 summarizes my sponsored costs. Costs in this testimony are presented in dollars, unless otherwise noted. In addition to this testimony, please refer to my workpapers for additional information on the Gas Engineering activities and programs described herein. The primary forecast methods used within my testimony are average, trending of historical cost, and base year forecasts. These methodologies best account for adjustments needed to support changes in federal and state regulations, increased safety activities, and development of new processes and procedures to improve safety, as well as reflecting changes or growth of certain teams in recent years. For reasons described in more detail below, each individual forecast represents the appropriate starting point to calculate TY 2024 operation and maintenance (O&M) expenses for the activities listed above and incorporates a moderate increase over each year.

The funding summarized below and described in my testimony is reasonable and represents the required O&M expense and capital investments for SoCalGas's Gas Engineering department to:

- Provide policies, guidance, and expertise to maintain compliance, safety, integrity, and effective operations of the Transmission, Distribution, Customer Service, and natural gas Storage systems;

- Provide guidance and expertise to support many of the controls and mitigations included within the SoCalGas 2021 Risk Assessment and Mitigation Phase (RAMP) chapters;[3]
- Respond timely to Operations to address concerns related to operations, maintenance, and construction activities;
- Develop a roadmap for hydrogen blending and identify policies and procedures that need to be updated or created to support a safe, reliable, and resilient system; and
- Continue to advance processes and technology through Research, Development, and Design (RD&D) to increase safety.

TABLE MM-1
Test Year 2024 Summary of Total Costs

GAS ENGINEERING (In 2021 $, in 000s)			
	2021 Adjusted-Recorded	**TY2024 Estimated**	**Change**
Total Non-Shared Services	15,488	16,445	957
Total Shared Services (Incurred)	14,677	16,598	1,921
Total O&M	**30,165**	**33,043**	**2,878**

GAS ENGINEERING (In 2021 $, in 000s)				
	2021 Adjusted-Recorded	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
Total CAPITAL	**21,179**	**18,953**	**18,033**	**24,153**

Gas Engineering plays an integral and critical role in providing enterprise guidance on multiple engineering and technical areas of expertise for SoCalGas and SDG&E. Gas Engineering primarily functions within the principles set forth by the Code of Federal Regulations (CFR), California Public Utilities Commission General Order No. 112-F, Geologic Energy Management Division (CalGem), California Code, California Public Utilities Code, guidance provided by the Pipeline and Hazardous Materials Safety Administration (PHMSA), and other regulating agencies. The enterprise support provided by Gas Engineering extends to

[3] SoCalGas' full 2021 Risk Assessment and Mitigation Phase (RAMP) and the accompanying Application, A.21.05.014, available at https://www.socalgas.com/regulatory/2021-ramp-report.

Transmission, Distribution, Storage and Customer Service operations to aid with field procedures, design, analysis, failure evaluations/testing, equipment guidance and troubleshooting, material specifications, designs, measurement, Right of Way, and a variety of other activities. Gas Engineering also supports Construction, Transmission, Storage, Control Center Modernization (CCM), and Integrity Management programs with design, creating/modifying project as-builts, project close out, commissioning, instrument and controls, non-destructive testing, destructive testing, and a variety of other activities. This support is provided through subject matter expertise across various engineering disciplines and technical expertise. Gas Engineering's key programs and activities are described in my testimony under these six broad groupings:

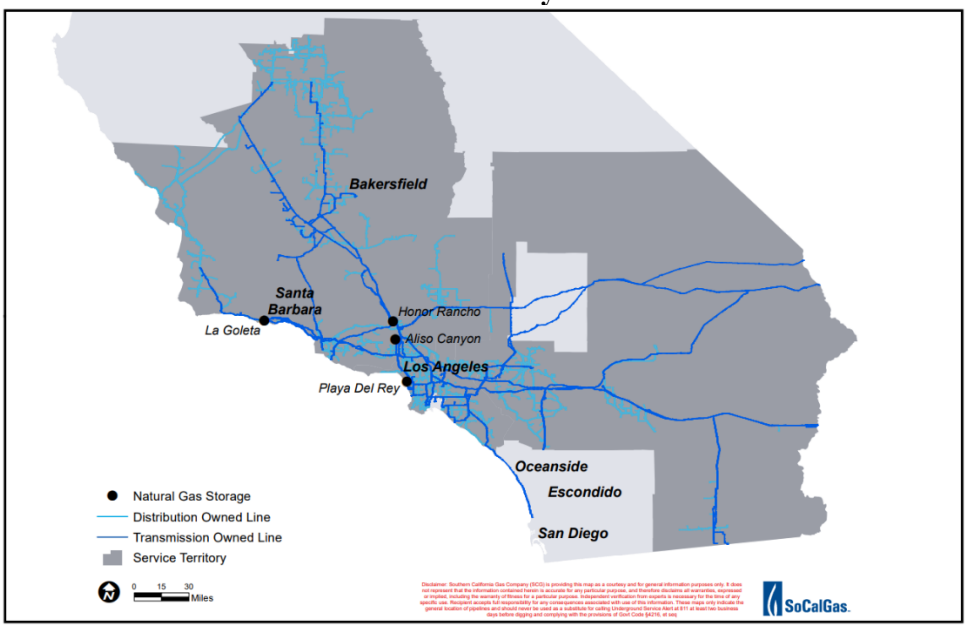
- Analysis, Testing, and Materials covering materials, lab testing, field support for compressors, manufacturing evaluation, coating, NDE inspections, and gas quality;
- Measurement and Regulations covering meters, regulators, policies, purchasing and field support;
- Land and Right of Way covering the acquisition and management of property rights;
- Research, Plastics, and Aviation covering RD&D along with policies related to plastic pipe and appurtenances and Aviation Services, which is a growing program to support Operations with innovative technology;
- Engineering Design Management covering the various engineering disciplines to support the Operations and Construction organization with policy, design, repair, or other maintenance activities; and
- Director of GE, VP GE/SI, and Hydrogen groups covering the overall strategic oversight with Gas Engineering for the Director position and the Vice President role extending to include oversight and guidance of the Integrity management departments and Operations training and policy teams. The Hydrogen team focuses on the pathway of transitioning the existing system toward clean fuels such as Hydrogen and RNG.

To promote continual improvement in the areas of safety, support the recently published and proposed Gas Transmission Safety Rule by PHMSA, and clean energy goals for SoCalGas, Gas Engineering will need to strategically leverage resources and, in some areas, expand groups.

SoCalGas System Overview

To better understand the expansiveness of Gas Engineering's areas of responsibility, a brief description of SoCalGas's gas operations and the size of the natural gas system is provided. SoCalGas is the largest distribution utility in the Nation, consisting of approximately 100,000+ miles of interconnected gas mains, services, and associated pipeline facilities. The Distribution system supplies natural gas through the Transmission system, which is comprised of approximately 3,440 miles of transmission pipeline and supported by 11 compressor stations and four underground storage fields. The pipeline system is designed to receive natural gas from interstate pipelines and various California production facilities. The system's primary function is to deliver natural gas to roughly 28.8 million consumers through 5.9 million[4] pipeline meters in more than 500 communities. The service territory is approximately 24,000 square miles stretching from Visalia, California to the Mexican border in the south and the Arizona border in the east.

Figure MM-1
Southern California Gas Company
Natural Gas System



[4] SoCalGas Company profile, available at: https://www.socalgas.com/about-us/company-profile.

B. Support To and From Other Witnesses

My testimony also references the testimony and workpapers of several other witnesses, either in support of their testimony or as referential support for mine. Those witnesses are:

- Mario Aguirre, Gas Distribution (Ex. SCG-04), discussing the incremental purchase of the Ultrasonic Meter pilot;
- Naim Jonathan Peress and Michelle Sim, Sustainability and Climate Policy (Ex. SCG-02, Ch. 1 and 2), discussing the climate goals related to Hydrogen Blending;
- Scott Wilder, Gas Customer Forecast (Ex. SCG-35);
- Rae Marie Yu, Regulatory Accounts (Ex. SCG-38), discussing the recovery of two Memorandum accounts; and
- Armando Infanzon, Clean Energy Innovations (Ex. SCG-12), containing discussions related to the RD&D Program for Gas Operations program further described within the Research, Plastic Materials, and Aviation section of this testimony.

Gas Engineering is also requesting vehicles for field support functions within the Aviation, EAC, and Measurement and Regulations teams. These vehicle resources are discussed in the testimony of Michael Franco, Fleet Services (Ex. SCG-18).

C. Organization of Testimony

My testimony will be organized as follows:

- Sustainability and Safety Culture
- Non-Shared Services
  - Analysis, Testing, and Materials
  - Measurement and Regulation
  - Land and Right of Way
  - Research, Plastic Material, and Aviation
- Shared Services
  - Analysis, Testing, and Materials
  - Measurement and Regulation
  - Research, Plastics, and Aviation
  - Engineering Design and Management

- Director of GE, VP GE/SI and Hydrogen
- Capital
  - Supervision and Engineering Overhead Pool
  - Land Rights
  - Engineering Tools and Equipment
- Conclusion

II. SUSTAINABILITYAND SAFETY CULTURE

Sustainability at SoCalGas focuses on continuous improvement, innovation, and partnerships to advance California's climate objectives by incorporating holistic and sustainable business practices and approaches. SoCalGas's sustainability strategy, ASPIRE 2045, integrates five key focus areas across the Company's operations to promote the public interest and the wellbeing of utility customers, employees, and other stakeholders.[5] Please refer to the Sustainability and Climate Change Policy testimony of Michelle Sim and Naim Jonathan Peress (Exhibit SCG-02) for a more detailed discussion of SoCalGas's sustainability and climate policies.

Safety is foundational to SoCalGas and SoCalGas's sustainability strategy. As the nation's largest gas distribution utility, the safety of SoCalGas's customers, employees, contractors, system, and the communities served has been – and will remain – a fundamental value for the Company and is interwoven in everything SoCalGas does. This safety-first culture is embedded in every aspect of SoCalGas's business. The tradition of providing safe and reliable service spans 150 years of the Company's history and is summarized in SoCalGas's Leadership Commitment statement, which is endorsed by the entire senior management team:

> *SoCalGas leadership is fully committed to safety as a core value. SoCalGas's Executive Leadership is responsible for overseeing reported safety concerns and promoting a strong, positive safety culture and an environment of trust that includes empowering employees to identify risks and to "Stop the Job.*

SoCalGas's approach to safety is one of continuous learning and improvement where all employees and contractors are encouraged and expected to engage in areas of opportunity for

[5] SoCalGas ASPIRE 2045, available at: https://www.socalgas.com/sites/default/files/2021-03/SoCalGas_Climate_Commitment.pdf

learning and promote open dialogue where learning can take place. To learn about SoCalGas's overall safety approach please see the Safety & Risk Management System testimony of Neena N. Master (Exhibit SCG-27).

The activities described in this testimony advance SoCalGas's sustainability priorities. For example, SoCalGas has started along the journey of evaluating and completing the deliverables of the Climate Change Adaptation Order Instituting Rulemaking (OIR) to incorporate within the next GRC cycle.[6] Although the OIR itself and deliverables are new, Gas Engineering has been engaged in continual climate change assessments. For example, SoCalGas has implemented a monitoring program leveraging strain gauges at several facilities vulnerable to geohazards. The vulnerability assessment for the Climate Change Adaptation OIR focuses on climate risks – specifically temperature, sea-level, wildfire, precipitation, and cascading impacts – to utility operations, services, and assets.[7] At the conclusion of the assessment, the expectation is to provide a portfolio of options dealing with short and long-term vulnerabilities, as mentioned within the next GRC. SoCalGas has established a memorandum account to capture activities related to the OIR mandates.[8]

To maintain energy resilience, it is critical that there is a diversification of fuel supply leading to the pathway of clean fuels such as hydrogen and Renewable Natural Gas (RNG) to support decarbonized energy. In the last few years, SoCalGas has focused on preparing its system and standards for RNG, which have been successfully implemented, for example, with the production of RNG at the four Senate Bill (SB) 1383 Dairy Farm pilots in the San Joaquin Valley.[9] These Dairy Farm pilots are an investment in reducing GHG emissions in California by capturing methane that would otherwise be released into the atmosphere. SoCalGas added four more Dairy Farm biomethane producers since the completion of the SB 1383 Dairy Farm pilot,

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[6] Decision (D.) 20-08-046; SoCalGas Advice Letter 5788-A, Annual Status Update regarding Southern California Gas Company's Climate Change Team and Activities, available at: https://tariff.socalgas.com/regulatory/tariffs/tm2/pdf/5788-A.pdf.

[7] D. 20-08-046 at 127 (Ordering Paragraph 9).

[8] SoCalGas Advice Letter 5694G, Establishment of the Climate Adaptation Vulnerability Assessment Memorandum Account (CAVAMA) Pursuant to Decision (D.) 20-08-046, available at: https://tariff.socalgas.com/regulatory/tariffs/tm2/pdf/5694.pdf.

[9] SB 1383 is part of an overall effort by California to reduce climate pollutants, which includes methane. SB 1383 required, among other things, that the CPUC implement "at least 5 dairy biomethane pilot projects to demonstrate interconnection to the common carrier pipeline system."

bringing the total number of operational dairy farm producer sites to eight. Gas Engineering provides system capacity and planning analyses, design services, gas quality testing, field support, and compression services for RNG producer developers. Also, SoCalGas continually participates in international discussions about RNG injection into gas utility infrastructure.

This GRC is a continuation of SoCalGas's efforts to support climate initiatives and goals while maintaining a safe and reliable system. For example, the next stage of evaluating hydrogen will continue to be supported by various departments, with the Hydrogen Blending Strategy team providing overall guidance and direction. One of the goals of these efforts is to validate that the clean fuels we deliver meet our customers' requirement to maintain reliability. Over the last few years, SoCalGas has participated in various research efforts to better understand the impact of clean fuels and validate reliability to the customers. These efforts have included participation with international consortiums focused on hydrogen blending, evaluating gas quality, impact to odorization, and appliance/equipment testing. In addition, along with maintaining reliability for our customers, it is critical that SoCalGas maintains the safety of its employees, customers, environment, and the energy infrastructure, which translates to increased monitoring, modernizing of material specifications, and updating procedures and business workflows as SoCalGas continues to transition to cleaner fuels.

In terms of safety, while there is no direct RAMP-related cost for Gas Engineering, the critical role Gas Engineering plays in completing the controls and mitigations that reduce system risk clearly increases the system's overall safety. For example, as part of the Dig-in Chapter for RAMP, optical pipeline monitoring technology is listed as a control that potentially provides an early warning system to reduce the risk of damage or an incident on a pipeline by detecting unauthorized construction activity or encroachments on the pipeline. The expertise and oversight for optical pipeline monitoring resides within the Measurement and Regulation group, providing a critical role in implementing the control. Another tangible example is Odorization, a control listed within the Incident Related to the High-Pressure System RAMP Chapter. Odorization is required to provide natural gas a readily detectable smell, which is necessary to uphold public and environmental safety by providing a warning system should there be a gas leak. The guidance and oversight for Odorization is provided by the Engineering Analysis Center, within the Gas Engineering department. Gas Engineering is prominently interrelated

with the mitigations and controls in the RAMP Chapters, as shown by the examples listed above and this holds true for other controls and mitigations.

III. NON-SHARED COSTS

"Non-Shared Services" are activities that are performed by a utility solely for its own benefit. Corporate Center is a cost center that provides certain services to the utilities and to other subsidiaries. For purposes of this GRC, SoCalGas treats costs for services received from Corporate Center as Non-Shared Services costs, consistent with any other outside vendor costs incurred by the utility. Table MM-2 summarizes the total non-shared O&M forecasts for the listed cost categories.

Included in this section of the testimony are activities and associated O&M expenses to address the core Gas Engineering duties in the (1) Analysis, Testing, and Materials; (2) Measurement and Regulation; (3) Land and Right of Way; and (4) Research, Plastics, and Aviation.

TABLE MM-2

Non-Shared O&M Summary of Costs

GAS ENGINEERING (In 2021 $, in 000s)			
Categories of Management	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Analysis, Testing, and Materials	6,351	7,082	731
Measurement and Regulation	4,850	4,711	(139)
Land and Right-of-Way	3,689	3,931	242
Research, Plastics, and Aviation	598	721	123
Total Non-Shared Services	**15,488**	**16,445**	**957**

A. Analysis, Testing, and Materials (Workpaper 2EN000)

TABLE MM-3

GAS ENGINEERING (In 2021 $, in 000s)			
Analysis, Testing, and Materials	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Analysis, Testing, and Materials	6,351	7,082	731
Total	**6,351**	**7,082**	**731**

1. Description of Costs and Underlying Activities

Under the broad category of Analysis, Testing, and Materials, non-shared activities are needed to maintain compliance and provide a safe and reliable operating system. The activities

are completed utilizing labor and non-labor as needed. The compliance activities provide a foundation which is augmented on a continual basis to maintain the safety of employees, contractors, customers, and the public as well as the gas system by being proactive and implementing programs and activities above and beyond compliance requirements, such as increased monitoring, continual evaluation of material and vendors, and technical expertise support to operations on a day-to-day basis.

Analysis, Testing, and Materials includes the Engineering Analysis Center (EAC), which provides testing and evaluation of materials and coatings, field operations support of compressors for Transmission and Storage across the service territory, and evaluation of equipment for performance to maintain the safety of employees, contractors, customers, and the public as well as the gas system. Over the years, the EAC has expanded to support material traceability and Non-Destructive Examination (NDE) oversight, which is reflected in the Base Year (BY) 2021 costs. To perform the oversight activities within the EAC, the team utilizes company vehicles to visit active construction sites to complete NDE and coating evaluations. A request for three additional vehicles is included within the testimony of Michael Franco, Fleet Services (Ex. SCG-18).

The development of the Material Quality Management (MQM) team provides overarching engineering policies for the development of material specifications, vendor assessments, material quality requirements, and material testing. In addition, the MQM team supports the company's operational business needs through coordination with Inventory and Logistics to help inventory and supply demands to meet operational needs. The MQM team provides oversight of construction projections, focusing on compliance with standards and procedures.

Below is the list of those cost centers:

- 2200-0301: Management
- 2200-1106: Materials Laboratory
- 2200-1107: Non-Destructive Examination (NDE) Program
- 2200-1179: Materials and Equipment
- 2200-1199: EAC Administration
- 2200-1180: Air Quality and Compressor Services
- 2200-1200: Applied Technologies Laboratory

- 2200-2300: Material Quality Management

2. Forecast Method

The forecast method developed for this cost category is a base year method. This method is most appropriate because it reflects the existing volume of activity and accounts for the growth the team has experienced in BY 2021 and will continue to see. As mentioned, the NDE and MQM teams have expanded over the last few years to provide centralized point of contact for Gas Engineering for construction oversight, material specifications, material quality management, and vendor evaluations which are accounted for in the base year. This centralized function allows for increased collaboration with Logistic and Inventory and Integrity Management. In addition, this team can provide strategic direction as federal requirements continue to emphasize material traceability.

3. Cost Drivers

Gas engineering costs are driven by compliance, emerging regulations, safety, reliability, and continual improvement. There is a need to continue to expand material testing services to support Integrity Management and to monitor the development of any new system threats. The other area of expansion is the centralized oversight and policy of material requirements and procurement as industry requirements continue to evolve. Recent global events impacting the supply chain for materials have highlighted the need to increase proactive activities related to inventory levels and vendor availability that meet the design requirements and the demands of Operations.

B. Measurement and Regulation (Workpaper 2EN002)

TABLE MM-3

GAS ENGINEERING (In 2021 $, in 000s))			
Measurement and Regulation	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Measurement and Regulation	4,850	4,711	(139)
Total	**4,850**	**4,711**	**(139)**

1. Description of Costs and Underlying Activities

Under the broad category of Measurement and Regulation, non-shared activities are needed to maintain compliance and provide a safe and reliable operating system. The team supports these activities leveraging labor and non-labor resources as needed. The activities include Gas Operations' support of meter repair, meter quality inspections, and records. In

addition, this group is also responsible for conducting engineering studies to determine replacement and performance enhancement strategies for installed measurement infrastructure, which includes the pilot of the Ultrasonic Meter for residential use. These activities are core functions of operations that require support on a continual basis. The team also manages the Natural Gas Vehicle (NGV) stations and Electrical Field Maintenance.

Below is the list of those cost centers:

- 2200-2265: NGV & Electrical Field Maintenance
- 2200-0798: Meter Shop & Records
- 2200-0799: Instrument Repair and Meter Quality

2. Ultrasonic Meters

Gas Engineering, in collaboration with Distribution Operations and Customer Services, is proposing a pilot of ultrasonic flow meters for residential use. Mario A. Aguirre's Gas Distribution testimony (Ex. SCG-04) includes the incremental costs to purchase the ultrasonic meters. Historically ultrasonic flow meters have been used at customers' locations or receipt points with high usage or locations that require a high degree of confidence. In general, ultrasonic flow meters create a small pressure drop, have no moving parts, and require less maintenance. The ultrasonic flow meter technology has continued to improve, become more widely used in the industry, and decreased in pricing. Although its pricing still exceeds that of a traditional meter, SoCalGas has started to see the meter manufacturers transition to a larger inventory of ultrasonic flow meters in recent years. In addition, SoCalGas has experienced an increase in lead times and one major meter manufacturer left the diaphragm meter market, which demonstrates why SoCalGas should be proactive in researching and piloting alternative meter measurement options.

While the ultrasonic flow meter has a slightly higher price point than traditional meters, there are numerous benefits that may offset the price difference. These benefits include self-diagnostic accuracy, shut-off capabilities, pressure monitoring, and slam shut regulator alarms. The ultrasonic flow meter's shut-off capabilities have numerous safety benefits, including significantly reducing response time to leak/odor concerns, potentially detecting anomalies in pressure that could indicate an overpressure or under-pressure situation, and reducing the risk of an incident. SoCalGas is looking to opportunistically conduct the pilot as part of new business installations. Ultimately, the measurement technology of ultrasonic flow meters is a proven

technology. The main goal of the pilot is to develop a roadmap, validate and test the technology in a controlled environment, leverage industry studies, and then deploy the technology. SoCalGas will continue to test and assess the incremental benefits of ultrasonic flow meters, namely, pressure detection, self-diagnostic capabilities using baseline assessments, and shut-off/on testing.

Considering the leading indicators of the changes in meter market and benefits of the ultrasonic flow meter, SoCalGas would like to move forward with the pilot of installing 90,000 ultrasonic flow meters. The primary costs of the pilot are associated with the incremental cost of the ultrasonic flow meter and is included in Mario A. Aguirre's Gas Distribution testimony (Ex. SCG-04) as a capital request under Budget Code 00163.

3. Forecast Method

The forecast method developed for this cost category is a five-year average. This method is most appropriate because the work activity is not expected to change. However, existing cost levels must be sustained to inspect, service, and maintain the electronic equipment, meter inventory and accuracy, and field operations supporting two NGV stations, which require electrical maintenance on a weekly basis.

4. Cost Drivers

The cost drivers behind this forecast consist of existing workforce and activities, which include maintenance visits to forty-two NGV stations, four RNG stations, and fourteen public NGV sites as well as meter inspections and repairs on an average of 100,000 meters and 150,000 MTUs (Meter Transmission Units) per year. Using the five-year average forecast method, Gas Engineering's TY 2024 forecast for Measurement and Regulation is $139,000 less than the BY 2021 adjusted-recorded expense level because a higher proportion of meter refurbishment work is being reclassified as capital work under Budget Code 00163. The five-year average provides the appropriate level of funding needed to meet the expected future needs of this organization.

C. Land and Right-of-Way (Workpaper 2EN001)

TABLE MM-4

GAS ENGINEERING (In 2021 $, in 000s)			
Land and Right-of-Way	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Land and Right-of-Way	3,689	3,931	242
Total	**3,689**	**3,931**	**242**

1. Description of Costs and Underlying Activities

SoCalGas has a vast pipeline network traversing public and private land. The Land and Right of Way group, within Gas Engineering, manages the necessary property rights that allow SoCalGas to access, operate, and maintain its pipeline infrastructure on public and private properties. SoCalGas compensates property holders in accordance with contractual obligations that allow SoCalGas to access, operate, and maintain its pipeline infrastructure that carries its natural gas across both private and public lands. This team also uses, as needed, a licensed surveyor on construction projects to support close-out and reconciliation within the Enterprise Geographic Information System that contains the pipeline network. The cost centers for this group are 2200-2368 and 2200-2472.

a. Morongo Rights of Way Memorandum Account (MROWMA)

SoCalGas operates three gas transmission pipelines (Lines 2000, 2001, and 5000) across federal land held in trust for the Morongo Band of Mission Indians (Morongo) near Cabazon, California (referred to as the Reservation). SoCalGas also operates a gas distribution system located on the Reservation serving the residential and commercial needs of Morongo. The three gas transmission pipelines are part of the Southern System and transport gas received from interstate pipelines at the Ehrenberg and Blythe receipt points, representing over 20 percent of the total system receipt point capacity. These three transmission pipelines are crucial to serving SoCalGas's customers, including Morongo and the SDG&E gas delivery system.

The three gas transmission pipelines provide a high level of service reliability on the Southern System and are required to serve the needs of SoCalGas's core and noncore customers pursuant to four existing rights-of-way granted by the Department of Interior (DOI) through the Bureau of Indian Affairs (BIA). During the last GRC, these four rights-of-way were scheduled to expire as follows:

- March 29, 2018 - Line 2000
- August 21, 2018 - Line 5000
- August 21, 2018 - Gas Distribution System
- March 22, 2020 - Line 2001[10]

[10] D.19-09-051 at 137-138.

SoCalGas established the MROWMA to record costs associated with the renewal of expiring rights-of way-within the Morongo Reservation, as directed in the GRC Decision, D.19-09.051, which held:

> We therefore find it reasonable to deny the requested authority to establish the MROWBA. Instead, the costs that are being requested to be recorded in the proposed MROWBA should be tracked in the MROWMA being authorized in this decision. Recovery of the tracked costs may then be requested by SoCalGas in its next GRC proceeding which the Commission can then review for reasonableness thereof. In its next GRC filing, SoCalGas should include testimony confirming any costs associated with Morongo ROW negotiations and/or resolution if an agreement is reached.[11]

After several years of negotiations, SoCalGas reached a resolution with Morongo to renew the right-of-way agreements for two of the two gas transmission pipelines (Lines 2001 and 5000) and allow the third agreement (Line 2000) to expire in 2020. The costs associated with these efforts plus SoCalGas's payments total approximately $105 million.

The right-of-way agreement for Line 2000 was allowed to expire, and line was abandoned. However, it should be noted that Line 2000 sections outside of the Reservation are still in-service. As presented in the last GRC, on June 27, 2017, Morongo sent SoCalGas a formal letter stating that the appropriate price for the renewals was $1.25 billion (nominal) to be paid over 50 years ($25 million per year for 50-year renewals of three rights-of-way), or, alternatively, an upfront payment of $308 million. SoCalGas's negotiations with Morongo came to an impasse.[12] SoCalGas made its best efforts over negotiations with Morongo spanning several years to reach an agreement that maintained pipelines critical to the gas infrastructure, while also considering other alternatives. The total costs related to the Gas Distribution System Right-of-Way are still pending and will continue to be captured in the memorandum account and sought to be recovered at a future date once the issue is resolved.

2. Forecast Method

The forecast method developed for this cost category is base year. The forecast was meant to capture current and future labor expense requirements. The base year methodology was

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[11] D.19-09-051 at 141; *See also* SoCalGas Advice Letter 5539, Modification and Amortization of the Regulatory Accounts in Compliance with Decision (D.)19-09-051 at 7, available at: https://tariff.socalgas.com/regulatory/tariffs/tm2/pdf/5539.pdf.

[12] D.18-04-012 at 10-12; D.19-09-051 at 135, 137-141.

selected because the historical costs did not represent the current and anticipated labor expense requirements. The Land and Right-of-Way team has expanded over the last few years to provide centralized point of contact for Land and Right-of-Way support, which now includes both labor and nonlabor activities that were previously within the Pipeline Safety Enhancement Plan (PSEP) in the TY2019 GRC. Current activity levels and support functions are expected to continue moving forward. As such, the base year forecast is expected to meet future funding requirements and will provide the labor resources necessary for the continual land right management support on projects and activities related to construction and maintenance of SoCalGas's pipelines system. In addition, incremental costs associated with Land and Right-of-Way labor expense requirements have been added to the base year forecast to reflect a minor increase over recent years along with an adjustment of two Full-Time Equivalents (FTEs) to support project volume, regional interactions with federal field offices, and local, state, and federal land management policy updates. This method is most appropriate to maintain the existing workforce while supporting a slight expansion to accommodate daily activities along with policy and procedure improvements.

3. Cost Drivers

The cost drivers behind this forecast are related to an increase in lease payments driven by the real estate market and jurisdictional agency payment rates. In addition, continual land management policy changes by federal and local agencies require increased interaction and support with these agencies unrelated to specific projects.

D. Research, Plastics, and Aviation (Workpaper 2EN003)

TABLE MM-5

GAS ENGINEERING (In 2021 $, in 000s)			
Research, Plastic Material and Aviation	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Research, Plastic Material and Aviation	598	721	123
Total	**598**	**721**	**123**

1. Description of Costs and Underlying Activities

Under the broad category of non-shared Research, Plastics, and Aviation, many core engineering activities are performed to maintain safe, resilient, and reliable operations and to support the various SoCalGas organizations utilizing both labor and non-labor resources. The Research, Plastics, and Aviation group provide a breadth of activities, including Research,

Development, and Demonstration (RD&D), which is used to assess and demonstrate emerging technologies that can mitigate environmental impacts, increase safety and reliability, and improve operating efficiency or otherwise reduce operating costs. While they are managed by Gas Engineering, the funding for the Gas Operations and Gas Emissions' respective RD&D programs are requested in Armando Infanzon's Clean Energy Innovations testimony (Ex. SCG-12) and Rae Marie Yu's Regulatory Accounts testimony (Ex. SCG-38) discussing the Natural Gas Leak Abatement Program Memorandum Account (NGLAPMA), which is also discussed in my testimony.

The Research, Plastics, and Aviation group also provides technical expertise and governance for plastic piping systems, including material requirements and testing, joining processes, and other operational processes related to the installation of plastic mains and services. The Aviation Services team governs all manned and unmanned flight activities supporting gas operations for safety and Federal Aviation Administration (FAA) regulatory compliance. This team also provides support services for gas operations using drone technology to supplement maintenance inspections within Operations that have been historically challenging to access, such as pipe spans, Services and Meter Set facilities on fenced and locked private property (referred to as Can't-Get-Ins (CGIs)), and areas impacted by hazards like mudslides. As part of this activity the Aviation Services team utilizes company vehicles to transport drones and equipment to the sites across the service territory, and a request for vehicles is included in Michael Franco' Fleet Services testimony (Ex. SCG-18).

Below is the list of those cost centers:

- 2200-0324: Gas Operations Research Development and Demonstration
- 2200-2400: Gas Emissions Research Development and Demonstration
- 2200-2067: Plastic Piping Systems
- 2200-2283: Aviation Services

2. Research, Plastics, and Aviation as Gas Operations' RD&D

In 2021, the Research, Plastic Materials and Aviation group recorded $526,980 in O&M expenses, including labor and non-labor charges. SoCalGas is requesting $720,000 in TY 2024 for labor and non-labor expenses arising from increased management of material specifications and gas standards for plastic piping systems, project costs, project management, and program administration performed by individuals in the Gas Engineering Department.

This section provides business justification for the Gas Operations portion of the SoCalGas RD&D program. As discussed earlier, the funding request for this portfolio is being requested in Armando Infanzon's Clean Energy Innovations testimony (Ex. SCG-12). The Gas Operations' RD&D program is managed in the Gas Engineering Department, and its goal is to develop, test, and introduce new technologies used in gas operations that are beneficial to ratepayers, public safety, pipeline safety, system reliability and integrity, regulatory compliance and environmental safety, and the reduction of emissions. The funding request for Gas Operations is consolidated within Armando Infanzon's Clean Energy Innovations testimony (Ex. SCG-12), which shows historic and proposed expenses in a single RD&D Balancing Account.

The Gas Operations' RD&D program does not duplicate programs led by State agencies, California Energy Commission (CEC), or universities, although SoCalGas may provide support to research projects sponsored by these organizations and agencies. Armando Infanzon's Clean Energy Innovations testimony (Ex. SCG-12) covers the ways in which SoCalGas's RD&D supplements and complements other RD&D programs. Within Gas Operations RD&D, the specific technology objectives and proposed project areas include, but are not limited to, continuing research to meet the regulatory requirements of Title 49 of the Code of Federal Regulations (CFR) § 192, California Public Utility Commission (CPUC) General Order (GO) No. 112-F, Assembly Bill (AB) 1440, AB 1900, the Clean Air Act, CPUC GO No. 156, CPUC Environmental and Social Justice (ESJ) Action Plan, and California Air Resources Board (CARB) Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.[13] Examples include pipeline material tracking and traceability, hydrogen blending assessments on engineering practices and materials science, renewable gas quality assessments, leak detection, pipeline and ground movement detection sensors, and internal pipeline robotic technologies. For example, the hydrogen blending research conducted through consortiums has included evaluating the impact of blending hydrogen in vintage steel and plastic pipelines.[14]

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[13] 49 CFR § 192 (Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards); GO No. 112-F (State of California Rules Governing Design, Construction, Testing, Operation, and Maintenance of Gas Gathering, Transmission, and Distribution Piping Systems) available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M163/K327/163327660.PDF; See also Senate Bill (SB) 887 (Natural Gas Storage Wells) available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB887

[14] The consortiums include, but are not limited to, Gas Technical Institute and Pipeline Research Council International.

In 2021, the Gas Operations RD&D program recorded $3,561,049 in RD&D expenses, including labor and non-labor charges plus an additional $181,742 for management and administration. Gas Operations RD&D's 2022 forecast is $4,515,808 for RD&D expenses and $356,270 for management and administration. Actual RD&D spending fluctuates from one year to the next due to the developmental nature of research efforts, which impacts project milestone and completion schedules. The program is managed within the multi-year GRC cycle where over and under-spending rolls over into the following year's forecast. SoCalGas is requesting $3,919,000 in TY 2024 for labor and non-labor expenses related to project costs and management plus $391,900 for program administration and milestone reviews performed by individuals in the Gas Engineering Department.

As directed in the TY 2019 GRC Decision and to increase transparency, SoCalGas has hosted an annual workshop under the supervision of the Commission's Energy Division to review the portfolio of activities and projects, findings, and benefits provided by RD&D.[15] In addition, prior to the workshop, SoCalGas submitted a comprehensive annual report to the Energy Division staff that included ongoing and completed projects, expenses, and the process used to select projects.[16]

The Gas Operations RD&D program uses highly leveraged dollars to provide an affordable means for the organization to stay abreast of emerging technology while sharing ideas and collaborating with other industry experts.[17] The program benefits ratepayers by improving operational efficiency and providing a safer and more reliable energy system based on lessons learned nationally from leading researchers, like National Laboratories.[18]

3. Forecast Method

The forecast method developed for this cost category is base year. The forecast was developed using a base year forecast method to capture future labor expense requirements and to account for projects that are being planned appropriately. Base year was selected because the

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[15] D.19-09-051 at 783 (Ordering Paragraph 30).

[16] SoCalGas's Research, Development, and Demonstration Program 2020 Annual Report, available at: https://www.socalgas.com/sites/default/files/2021-06/2020-SoCalGas-RDD-Annual-Report.pdf

[17] *Id.* at 13 ("the SoCalGas RD&D Program invested $14,894,000 in numerous projects across the entire gas value chain.")

[18] National Laboratories is a leading institution in the United States for scientific innovation, addressing large scale, complex research, and development challenges.

historical costs did not represent the anticipated labor expense requirements. Current activity levels and support functions are expected to continue moving forward. As such, the base year forecast is expected to meet future funding requirements and will provide the labor resources needed to support changes in regulations, increase of safety activities, development of new processes that improve safety and system reliability, and to improve operational efficiency or otherwise reduce operating costs. In addition, incremental costs associated with Gas Operations labor expense requirements have been added to the base year forecast.

4. Cost Drivers

The cost drivers behind this forecast are related to increasing the support provided to Operations through the Aviation Services team. During the current GRC cycle the Aviation Services team has collaborated with Operations to identify opportunities to leverage manned and unmanned (drone) aircraft with a variety of inspection technologies and use cases. Manned aircraft are used to obtain aerial imagery and modeling of land features and facilities, pipeline patrol, leakage survey, emissions plume modeling, and facility inspections. Many applications of drone technologies have provided positive results in hard-to-access locations and facilities, including the inspection of pipeline on bridges and spans, support during emergency situations, and, most recently, a pilot to support Distribution leakage survey of Services and Meter Set inspections of CGIs. In 2021, Unmanned Aerial Vehicles (UAVs) support services was utilized for 35 flight missions, resulting in 78 days with flight operations totaling 4800 flight minutes; and manned aircraft support services conducted 132 days with flight operations totaling over 750 flight hours.

IV. SHARED COSTS

As described in Angel N. Le and Paul D. Malin's Shared Services Billing, Shared Assets Billing, Segmentation, and Capital Reassignments testimony (Ex. SCG-30), Shared Services are activities performed by a utility shared services department (i.e., functional area) for the benefit of: (i) SDG&E or SoCalGas, (ii) Sempra Energy Corporate Center, and/or (iii) any affiliate subsidiaries. The utility providing Shared Services allocates and bills incurred costs to the entity or entities receiving those services.

Table MM-6 summarizes the total shared O&M forecasts for the listed cost categories.

TABLE MM-6

Shared O&M Summary of Costs

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Categories of Management	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Analysis, Testing, and Materials	2,211	2,662	451
Measurement and Regulation	3,818	3,997	179
Research, Plastic Material, and Aviation	91	78	(13)
Engineering Design, and Management	5,951	6,218	267
Director of GE, VP GE/SI and Hydrogen	2,606	3,643	1,037
Total Shared Services (Incurred)	**14,677**	**16,598**	**1,921**

I am sponsoring the forecasts on a total incurred basis, as well as the shared services allocation percentages related to those costs. Those percentages are presented in my shared services workpapers, along with a description explaining the activities being allocated.[19] The dollar amounts allocated to affiliates are presented in Angel N. Le and Paul D. Malin's Shared Services Billing, Shared Assets Billing, Segmentation, and Capital Reassignments testimony (Ex. SCG-30).

Under the broad category of Gas Engineering, many core engineering activities are performed to maintain safe, resilient, and reliable operations and to support operations and other organizations at SoCalGas. In my testimony, these core engineering activities are divided into the following six groups to provide a clearer overview of the work and development of the shared costs forecast:

- Analysis, Testing, and Materials
- Measurement and Regulations
- Research, Plastics and Aviation
- Engineering Design Management
- Director of GE, VP GE/SI and Hydrogen

[19] See Ex. SCG-07-WP.

A. Analysis, Testing, and Materials (Workpaper 2200-1178)

TABLE MM-7

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Analysis, Testing, and Materials	**2021 Adjusted-Recorded**	**TY2024 Estimated (**	**Change**
Engineering Analysis Center	2,211	2,662	451

1. Description of Costs and Underlying Activities

The Engineering Analysis Center (EAC) Chemical section provides support to the Environmental Organization and Gas Operation for SoCalGas and SDG&E. These support activities include sample management, hazardous material, gas quality policy and operating procedures, gas composition, odorization management and test development, gas line odor seasoning management and training, fugitive and leakage gas identification and verification, and gas quality testing, which includes mobile gas operations test vehicles and British Thermal Unit (BTU) measurements. These activities help verify that quality natural gas is delivered and detected. These activities often require the team to visit the field to support Gas Operations and troubleshoot concerns. The EAC is requesting one vehicle in Michael Franco's Fleet Services testimony (Ex. SCG-18) to support these activities.

2. Forecast Method

The forecast method developed for this cost activity is the five-year linear method. This method is most appropriate because the nature of work performed by the EAC Chemical section has been increasing in volume. For example, in 2019 the EAC completed 32 projects related to injection of odorant. In 2021, the volume increased to 58 projects, nearly double the amount. The EAC Chemical section anticipates this work to continue increasing and that the five-year linear method will provide the non-labor resources needed to respond to changes in regulations, increase of safety activities, and develop new processes and procedures to improve safety.

3. Cost Drivers

Gas engineering costs are driving increased support of RNG activities and field testing to support compliance with Rule 30 and Rule 45.[20] In addition, SoCalGas is requesting incremental

[20] Rule 30 governs the general terms and conditions applicable whenever the Utility System Operator transports customer owned gas, including wholesale customers, the Utility Gas Procurement

funding for FTE related to industrial water management to support knowledge transfer, continual improvement of existing processes, and evaluation of data to support water treatments for the compressor stations.

B. Measurement and Regulation - MRC Management & Design (WP 2200-0309)

TABLE MM-8

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Measurement and Regulation	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
MRC Management & Design	2,077	2,310	233
Metrology	243	274	31
Measurement	1,498	1,413	(85)
Incurred Costs Total	**3,818**	**3,997**	**179**

1. Description of Costs and Underlying Activities

The MRC Management and Design group is responsible for the detailed engineering design, planning, policy, equipment standards, and consultation activities related to large meter and regulator stations, interstate pipeline interconnections, and pressure protection for pipelines and related automated controls. The workpaper and associated forecast also represent the system engineering associated with the design, operation, and the related compliance and safety aspects of large gas handling facilities. As these stations and facilities are commissioned into service, the MRC Management and Design group provides on-site support across the service territory to validate that equipment is working as intended. MRC Management and Design group is requesting one vehicle to support this activity in Michael Franco's Fleet Services testimony (Ex. SCG-18).

In addition, MRC Management and Design provides the policies and guidance for optical pipeline monitoring installations and supports the construction and continual maintenance of this technology. MRC Management and Design group is requesting one vehicle to support this activity and the incremental headcount request in 2024 in Michael Franco's Fleet Services testimony (Ex. SCG-18). These engineering services are shared and provided for both SoCalGas

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Department, other end-use customers, aggregators, marketers and storage customers. (*See* SoCalGas Rule 30, available at: https://tariff.socalgas.com/regulatory/tariffs/tm2/pdf/30.pdf.) Rule 45 governs the Standard Renewable Gas Interconnections to the Utility's Pipeline System. (*See* SoCalGas Rule 45, available at: https://tariff.socalgas.com/regulatory/tariffs/tm2/pdf/45.pdf.)

and SDG&E. MRC Management and Design group supports the operational personnel associated with the design, material specifications, and policy for managing gas transmission and storage and gas distribution assets.

2. Forecast Method

The forecast method developed for this cost activity is the five-year average. The nature of MRC Management and Design group's work has proven to be consistent over time, as evidenced by historical recorded costs in this cost center. Current activity levels and support functions are expected to continue moving forward. The five-year average serves as the best indication of the ongoing requirements for this group and is expected to meet future funding requirements. In addition, incremental costs associated with Measurement, Regulation and Control labor expense requirements have been added to the five-year average forecast.

3. Cost Drivers

The cost drivers for the MRC Management and Design group include the development of standards, designs, procedures, and field support. On an incremental basis these efforts support the expanding safety measurements being implemented as part of the Control Center Modernization project, which looks to increase monitoring of pressure and methane across the system. MRC Management and Design group will provide continual support for these field devices, along with contributing to the appropriate policies and procedures. In addition, requirements for optical pipeline monitoring installations require design, standards, and field support on a continual basis as technology is installed, monitored, and enhanced is required. The request for these functions is 2.5 FTEs.

C. Measurement and Regulation - Metrology (WP 2200-2627, 2200-0311)

TABLE MM-9

GAS ENGINEERING (In 2021 $)			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Measurement and Regulation	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
MRC Management & Design	2,077	2,310	233
Metrology	243	274	31
Measurement	1,498	1,413	(85)
Incurred Costs Total	**3,818**	**3,997**	**179**

1. Description of Costs and Underlying Activities

The Metrology group includes activities that provide calibration of temperature and

pressure gauges and secondary standards (a recognized and acceptable alternative to using the primary calibration standard) used for: field maintenance of gas facilities, field inspection of large metering facilities using bore scoping techniques, maintenance of company gas standards used to test and calibrate gas meters, and the laboratory configuration, programming, testing and repair/assessment of electronic measurement devices used for customer billing. Special meter testing is also conducted on gas meters removed from the field, where safety or other matters are investigated. This cost center also provides for the maintenance, troubleshooting, repair and upgrade of "bell provers" (primary measurement test standards) used by both SDG&E and SoCalGas to test over 100,000 meters annually.

2. Forecast Method

The forecast method developed for this cost activity is the five-year average. The nature of Metrology group's work has primarily been consistent over time with minor fluctuations, as evidenced by historical recorded costs in this cost center. The five-year average also reflects recent efficiencies by the group in recent years, due to technological advancements and streamlined quality assurance processes. Current activity levels and support functions are expected to continue moving forward. The five-year average serves as the best indication of the ongoing requirements for this group and is expected to meet future funding requirements.

3. Cost Drivers

Cost drivers for this group are related to existing activity levels required to inspect new meters and MTU's to American National Standards Institute (ANSI) standards and maintain bell provers in the meter shop, perform borescope inspections related to maintenance activities, and the recertification of secondary standards used by field personnel.

D. Measurement and Regulation - Measurement (WP 2200-0311)

TABLE MM-10

GAS ENGINEERING (In 2021 $)			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Measurement and Regulation	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
MRC Management & Design	2,077	2,310	233
Metrology	243	274	31
Measurement	1,498	1,413	(85)
Incurred Costs Total	**3,818**	**3,997**	**179**

1. Description of Costs and Underlying Activities

The Measurement group is responsible for testing, evaluation, selection, and policies and practices associated with gas metering equipment ranging from the smallest residential diaphragm meters to the largest ultrasonic meters and electronic measurement equipment. This work is conducted on behalf of both SDG&E and SoCalGas. This group is also responsible for managing the company's meter accuracy and commercial industrial regulator maintenance. In addition, the Measurement team issues inspection schedules, reports, and reconciles all activity related to the life cycle of meters and MTU's, and provides auditing of company measurement sites to validate compliance with policy and technical specifications.

2. Forecast Method

The forecast method developed for this cost activity is the four-year average. The nature of the Measurement group's work has primarily been consistent over time with minor fluctuations, as evidenced by historical recorded costs in this cost center. The four-year average also reflects recent efficiencies by the Measurement group in recent years, including reducing the number of support trips to the field by creating job aides to address frequently asked questions. Current activity levels and support functions are expected to continue moving forward. The four-year average serves as the best indication of the ongoing requirements for this group and is expected to meet future funding requirements. In addition, incremental costs associated with the increase of safety activities, such as CCM or changes in the federal and state regulations, have been added to the four-year average forecast for TY 2024.

3. Cost Drivers

Cost drivers for this group are related to supporting existing activity levels required to evaluate, test, and approve measurement equipment.

E. Research, Plastic, and Aviation (WP 2200-0320)

TABLE MM-11

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Research, Plastics and Aviation	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Research, Plastic and Aviation	91	78	(13)

1. Description of Costs and Underlying Activities

This cost center includes labor and non-labor expenses associated with managerial and budgetary oversight, planning, and project management for the Research, Plastics, and Aviation group. This cost center assists in the development of the strategic direction for plastic pipe and appurtenances in terms of material quality, procedures, and evaluation of equipment for the field.

2. Forecast Method

The five-year average was chosen as the foundation for future labor expense requirements. The five-year average provides an outlook consistent with expenses moving forward, which include the manager position, incremental Project Manager, and reductions in labor in recent years.

3. Cost Drivers

The cost drivers are the maintenance of existing oversight of the overall group, incremental Project Management to support Plastics and Aviation's teams in companywide initiatives like Management of Change, and administrative support due to increases in activities as the group expands its responsibilities related to aviation services and plastics. Overall, there is still a reduction in the cost center since the team has supported other refundable or capital programs in recent years.

F. Engineering Design and Management (WP 2200-0026)

TABLE MM-12

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Engineering Design and Management	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Electrical, Process, Mechanical Engineering, Info Tech, and Instrument Control (2200-0026)	2,198	2,432	234

1. Description of Costs and Underlying Activities

The Engineering Design and Management group is composed of various engineering and design elements including the Process, Mechanical, Electrical, and Instrument and Controls.

The Design Drafting, Project Engineering and Distribution Engineering teams support the engineering and design disciplines. The Gas Process Engineering team provides technical expertise in process engineering systems and supports the operations and maintenance and design of process systems and equipment for storage fields and transmission systems. The Mechanical team provides guidance and policies related to mechanical design and technical expertise during project design. The Electrical team provides guidance and policies related to electrical design and electrical equipment within the various facilities and stations across the service territory.

The Instrument and Control (I&C) team is primarily responsible for design, installation, and support of instrumentation, process measurement, and control equipment and systems used across our gas system infrastructure. This equipment is used to process, operate, and monitor large pipeline valves, customer gas measurement facilities, gas compressors, generator engines, wellhead safety systems, natural gas dehydration systems, GHG emissions, and various other stand-alone process variables such as pressure, temperature, level, and vibration sensing.

The Engineering Info Tech (EIT) team provides strategies for the establishment and utilization of data centric design applications such as intelligent PIDs and 3D models. This team also develops working instructions, workflows, data requirements, and asset tagging standards related to those design applications. The EIT team's goals are to provide quality and consistency of engineering information to support the integration and visualization of data and documents of all types across platforms.

2. Forecast Method

The forecast method developed for this cost category is the base year method. This method is most appropriate because activities and staffing levels have increased in volume. Gas Engineering anticipates this work will continue increasing and that the base year method will provide the labor resources needed to support addressing changes in State, Federal and CPUC regulations. In addition, incremental costs associated with the increase of safety activities or the development of new processes and procedures to improve safety have been added to the base year forecast.

3. Cost Drivers

Over recent years there has been a transition to modeling complex facilities within a 3D software environment that provides integrated engineering design tool to support construction, analysis, and integrity projects. Increases in labor and non-labor are necessary to sustain these established processes, continual improvement, training, and coordination of Management of Change to support changes in the federal and state regulations, like stamping of drawings by professional licensed engineers. The incremental costs of 1.7 FTEs associated with supporting these activities have been added to the base-year forecast for TY 2024.

G. Engineering Design and Management (WP 2200-0318)

TABLE MM-13

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Engineering Design and Management	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Pipeline Engineering Manager (2200-0318)	102	204	102

1. Description of Costs and Underlying Activities

Engineering Design Manager's cost center has administrative, managerial, and budgetary oversight over the following engineering activities: Design Drafting, Pipeline Engineering, Gas Process Engineering, Mechanical Engineering, Electrical Engineering and Design, Engineering Information Technology, Civil/Structural and Hazard Mitigation and Distribution System Engineering Support.

2. Forecast Method

The five-year average method was chosen as the foundation for future labor expense requirements. The nature of O&M work performed by the Engineering Design Manager has proven to be consistent over time, as evidenced by historical recorded costs in this cost center. Current activity levels and support functions are expected to continue. The five-year average serves as the best indication of the ongoing requirements for this organization and is expected to meet future funding requirements.

3. Cost Drivers

The cost drivers for this cost center will support current activity levels and support functions are expected to continue moving forward as the Engineering Design Manager plays an overall critical role in the management of the team.

H. Engineering Design and Management (WP 2200-0322)

TABLE MM-14

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Engineering Design and Management	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
Pipeline Engineering Design (2200-0322)	3,528	3,137	-391

1. Description of Costs and Underlying Activities

The Pipeline Engineering Design group assesses new and existing pipelines for transmission, distribution, and storage. For existing pipelines, the group assesses various loadings on pipe, such as surface loadings from vehicles and construction equipment. The group also evaluates existing spans and crossings, piping vibration at compressor stations, and pipelines impacted by ground movement. Other tasks include assessing pipeline operations, including purging, pipeline lowering, maximum allowable operating pressure (MAOP) increases, failure analyses, transmission line pressure testing, and stress analyses for piping design.

The Pipeline Engineering Design group develops and manages pipeline engineering gas standards and procedures and material specifications related to the design, construction, maintenance, pressure testing, and operation of pipelines. The group is involved with the

Pipeline Research Council International (PRCI)[21] to improve pipeline safety by designing new pipelines as well as addressing potential concerns with existing pipe. Examples of research areas include improving assessment of vintage pipelines, seismic and landslide mitigation, fitting integrity, and loading on pipe. The Pipeline Engineering Design group performs annual reviews of pipeline engineering O&M standards and updates them as needed. The group also sets and updates pipeline engineering policies that provide the required pipe specifications for SoCalGas and SDG&E.

The Design Drafting team provides guidance and policies relating to drawing design requirements, deployment of intelligent and 3D software technology, laser scanning, as-built support, quality assurance of construction packages, processing, and finalization of reconciliation packages.

The Civil/Structural and Hazard Mitigation team is responsible for policies relating to geohazards, evaluation of potential hazards and mitigation proposals, structural assessments and design, and on-going evaluations of geohazard related issues such as wildfire, earthquakes, subsidence, and landslides.

The Distribution System Engineering Support team focuses on providing the Distribution engineering groups with technical, data, and policy support, as well as developing and implementing new technologies to enhance safety, effectiveness, and productivity in those groups. Specific activities include: (1) the creation and validation of computer hydraulic models of medium and high-pressure pipe Distribution networks; (2) managing and enhancing the company's pressure monitoring programs; (3) developing and providing system design and analysis training to Distribution Engineering employee; (4) meeting the requirements of Senate Bill (SB) 1383[22] and evaluating other renewable gas sources; (5) providing engineering data analytics and performance optimization services on gas assets; and (6) providing project management over a range of other areas, including gas blown to atmosphere, isolation area

[21] The Pipeline Research Council International is a community consisting of the world's leading pipeline companies and the vendors, service providers, equipment manufacturers, and other organizations supporting the energy industry.

[22] SB 1383 requires the CPUC to direct gas corporations to implement not less than five dairy biomethane pilot projects to demonstrate interconnection to the common carrier pipeline system. The CPUC initiated R.17-06-015, the Dairy Biomethane Pilot Rulemaking, for the selection and implementation of these pilot projects.

management, year-end gas inventory calculation and reporting, review and update of company standards, and participation on industry committees.

2. Forecast Method

The forecast method developed for this cost category for labor is the three-year average method. This method is most appropriate because the historical data indicates that activities and staffing levels have increased in the past three years (2019 through 2021). In 2021, there was a one-time decrease of $1 million to remove non-labor expenditures related to a geohazard mitigation and seismic engineering study. As a result, the TY 2024 forecast shows a decrease of $391,000 from the base year recorded. However, current activity levels and support functions are expected to continue moving forward. In addition, incremental costs associated with the increase of safety activities, such as CCM or changes in federal, state and CPUC regulations, have been added to the three-year average forecast for TY 2024.

3. Cost Drivers

The cost drivers associated with the increasing staffing level are due to an increase in volume and complexity of projects and drawings, for example, supporting drawings and design following the deployment of intelligent and 3D software technology and laser scanning. Gas Engineering anticipates this work to continue and that the three-year average method will provide the labor resources needed to support addressing changes in federal and state regulations, such as stamping of drawings by professional licensed engineers, increase of safety activities, such as CCM, or development of new processes and procedures to improve safety. In addition, incremental costs associated with Pipeline Engineering Support labor expense requirements have been added to the three-year average forecast for TY 2024.

I. Project Engineering (WP 2200-1096)

TABLE MM-15

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Engineering Design and Management	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Project Engineering	123	447	324

1. Description of Costs and Underlying Activities

The Project Engineering department consists of project engineers, team leads, and a manager. Members of the department provide engineering support for project execution from

initiation to close-out, including development of project scopes and schedules, execution of technical deliverables, and project status reporting. Project Engineering also provides coordination with company subject matter experts and engineering oversight for project execution. Engineers provide support to a variety of project types, including but not limited to, major compressor station modernization, renewable natural gas, control center modernization and traditional Gas Transmission and Gas Storage projects.

2. Forecast Method

The forecast method developed for this cost category is a base year methodology. This method is most appropriate because there is an insufficient history of costs. The department was newly formed in 2021.

3. Cost Drivers

Current activity levels and support functions are expected to continue. As such, the base year forecast is expected to meet future funding requirements and will provide the labor resources needed to support responding to changes in regulations, increases in safety activities, or the development of new processes and procedures to improve safety. Incremental costs associated with the Project Engineering activities were added to the base year forecast to reflect future labor requirements.

J. Director of Gas Engineering, Vice President of Gas Engineering and System Integrity, and Hydrogen Blending (WP 2200-0300)

TABLE MM-16

GAS ENGINEERING			
(In 2021 $, in 000s) Incurred Costs (100% Level)			
Director of GE, VP of GE/SI and Hydrogen	**2021 Adjusted-Recorded**	**TY2024 Estimated**	**Change**
Director of GE, VP of GE/SI and Hydrogen	2,606	3,643	1,037

1. Description of Costs and Underlying Activities

Included within this workpaper are the cost centers for the Director of Gas Engineering and Vice President of Gas Engineering and System Integrity, and Hydrogen Blending team. The expenditures incurred by the Vice President and Director of Gas Engineering are related to setting the goals and vision for Gas Engineering in alignment with company goals, financial support, and administrative functions. The Vice President and Director roles provide governance and technical and policy support for the various Operating groups for SoCalGas and SDG&E.

The Hydrogen Blending Strategy team is responsible for developing a roadmap to evaluate the ability to blend hydrogen into the system. The roadmap includes research efforts, collaborations with industry partners, updates to policies, standards and procedures, and the development of hydrogen blending pilot projects (subject to the CPUC's authorization) to validate research findings. For instance, SoCalGas and SDG&E are submitting a Hydrogen Blending Pilot Project Application to discuss the current policy and technical status of hydrogen as an energy source, and to seek approval of balancing accounts for each respective Utility. The initial small-scale pilot project will generate crucial information and knowledge that will help inform and guide future large-scale demonstration projects involving additional materials and systems, with the goal of gradually increasing the percentage of hydrogen blended into SoCalGas and SDG&E's existing pipeline systems. In addition, as part of the application, SoCalGas proposes that the program will inform revisions to the Standard Renewable Gas Interconnection (SRGI) Tariff.

The labor expenditures incurred by the 1.5 FTEs requested for the Hydrogen Blending Strategy team are intended to support the engineering analysis, pilot projects, and research related to introducing hydrogen into the natural gas system. These activities support the overall development of the Hydrogen Blending plan for SoCalGas.[23] The nonlabor expenditures will be utilized for consulting services to support a temporary increase of activity related to updating material specifications (i.e., for pipes, valves, fittings), equipment specifications, gas standards, and other policies based on the lessons learned from the multiple research activities and the impact of hydrogen on the system. In addition to updates, new equipment specifications will be developed for hydrogen blending equipment that will include on-site storage, generation, and process equipment.

2. Forecast Method

The forecast was developed for this cost category using a base year methodology. This methodology reflects the future labor expense requirements for this workpaper group to provide the resources to introduce hydrogen and RNG into the natural gas system. Other forecasting methodologies, such as a five-year average, are not appropriate because the Hydrogen Blending Strategy organization is a newly created function which did not occur in previous years and does

[23] SoCalGas may also pursue 100% green hydrogen projects, like the Angeles Link Project, enabling the delivery of renewable green hydrogen into the Los Angeles Basin.

not have a sufficient historical cost. In addition, incremental adjustments associated with the Hydrogen Blending program labor expense requirements have been added to the base year forecast.

3. Cost Drivers

Cost drivers are related to expenses required to support Hydrogen blending operational readiness including development of Material Specifications, update of Operations Standards, Management of Change, and the development of safety training for Operations and First Responders.

V. CAPITAL

This chapter of my testimony covers capital expenditures estimated for SoCalGas's Engineering operations for transmission projects related to land rights, capital tools, laboratory equipment, and the overheads for the local Supervision and Engineering capital pool. The driving philosophy behind SoCalGas's capital expenditure plan is to provide the safe, resilient, and reliable delivery of natural gas to customers at a reasonable cost. These investments also enhance the efficiency and responsiveness of our gas operations and maintain compliance with applicable regulatory and environmental regulations. Table MM-17 provides a summary of Gas Engineering's capital forecasts for 2022, 2023, and 2024.

TABLE MM-17

Capital Expenditures Summary of Costs

GAS ENGINEERING (In 2021 $, in 000s)				
Categories of Management	**2021 Adjusted-Recorded**	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
Engineering Tools and Equipment	1,517	1,693	1,773	2,193
Land Rights	199	1,361	361	3,061
Supervision and Engineering Overhead Pool	19,463	15,899	15,899	18,899
Total	**21,179**	**18,953**	**18,033**	**24,153**

A. Engineering Tools and Equipment

TABLE MM-18

GAS ENGINEERING (In 2021 $, in 000s)				
Engineering Tools and Equipment	**2021 Adjusted-Recorded**	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
1. Engineering Tools & Equipment (Budget Code 730)	1,517	1,693	1,693	1,693

1. Description of Costs and Underlying Activities

The forecast for Budget Code 730 is $1.69 million for each of 2022, 2023, and 2024. The capital funding is needed for the essential operations of the Engineering Analysis Center (EAC) and its various laboratory activities related to testing of pipe samples, processing of environmental samples, emissions, odorization, and gas quality, amongst other activities. The EAC is a functioning laboratory which is used by Air Quality and Compressor Services, Materials Quality Management, Non-Destructive Examination (NDE) Program, and the Applied Technologies Lab. The funding is utilized to maintain, purchase or upgrade laboratory equipment.

2. Forecast Method

The forecast method used is the five-year (2017-2021) average of recorded labor and non-labor costs in this budget code. A five-year average represents a reasonable basis to estimate operational needs for TY 2024 because laboratory equipment costs are prone to fluctuations driven by supply and demand and changes in work activities that drive equipment needs. The five-year average best represents the capital expenditures in this category.

3. Cost Drivers

Existing regulations require equipment upgrades for both pipeline and engine monitoring.[24] The funding is needed to maintain equipment available and ready to support Operations with compliance requirements, field testing, monitoring, and emergency response. Like any technology, there is continual advancement in instrumentation and equipment providing increased accuracy and efficiency, most often at a greater cost. Equipment and instrumentation

[24] *See* 49 C.F.R. Part 192 (Subpart M) – Maintenance, which prescribes minimum requirements for maintenance of pipeline facilities.

are evaluated as needed to determine replacement needs and includes evaluation of life expectancy, regulatory drivers, and cost.

B. Aviation Services

TABLE MM-19

GAS ENGINEERING (In 2021 $, in 000s)				
Engineering Tools and Equipment	**2021 Adjusted-Recorded**	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
2. Aviation Services (Budget Code 343)	0	0	80	500

1. Description of Costs and Underlying Activities

The forecast for Budget Code 343 for 2022, 2023, and 2024 are $0, $ 0.08 million, and $0.5 million, respectively. This category provides capital funding for the Aviation Services team to purchase aerial-based tools, like unmanned aircraft, and ancillary equipment needed to support Gas Operations to conduct historically challenging inspections at areas that are remote, difficult to access, or hazardous to patrol and perform leak surveys or emergency response.

2. Forecast Method

The forecast used a zero-based methodology, because this is a relatively new activity and historical spending is not reflective of future costs required for the administration and development of the unmanned aerial technology equipment and uses. This Budget Code is planned to Capital in 2023, 2024, 2025, and 2026. Other forecast methodologies, such as the five-year average methodology, are not appropriate because they do not take into account the future purchases of Unmanned Aerial Vehicles (UAVs) and ancillary equipment. (*See* Supplemental Capital Workpaper for Zero-Base Forecast Aviation Services (Ex. SCG-07-EN-CAP Supp BC 003430).)

3. Cost Drivers

The cost drivers are supporting the advancement of aviation-based technology solutions and services for Gas Operations by providing aviation-related expertise, equipment and technical know-how enabling the development of safe and efficient uses for aerial based tools and technologies. These investments also enhance the responsiveness of Gas Operations in certain areas and supports compliance with applicable regulatory and environmental regulations.

C. Land and Right-of-Way

TABLE MM-20

GAS ENGINEERING (In 2021 $, in 000s)				
Lands and Right-of-Way	**2021 Adjusted-Recorded**	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
Land Rights (Budget Code 617)	199	1,361	361	3,061

1. Description of Costs and Underlying Activities

The forecast for Budget Code 617 for 2022, 2023, and 2024 are $1.4M, $ 0.4M, and $3.1M, respectively. This category provides capital funding to acquire land or land rights necessary to allow for the access, construction, operation, and maintenance of pipeline infrastructure on public and private properties. Federal law requires public utility lines occupying private or public lands must be protected through the acquisition of appropriate land rights.[25] SoCalGas pays compensation for the necessary property interests according to the terms of controlling contracts that allow for access, operation, and maintenance of SoCalGas's pipeline infrastructure traversing public and private properties.

2. Forecast Method

The forecast method developed for this cost category is the five-year average methodology, which captures labor and non-labor expense requirements for this cost category. This method is most appropriate because the historical data accounts for fluctuations in acquisition costs driven by market conditions, negotiated contractual terms, and published rent schedules for public lands under federal jurisdiction. Current base activity levels and support functions are expected to remain constant. As such, the five-year average forecast is expected to meet future funding requirements. In addition, incremental one-time adjustments have been added to the base five-year average.

[25] *See* The Constitution of the United States, Amendment 5; 30 U.S.C. §185 et seq. (The Mineral Leasing Act of 1920).

3. Cost Drivers

The underlying cost driver for this budget code is the project support across SoCalGas needed to provide a safe, resilient, and reliable system. This project portfolio includes continual land right management support for projects and activities related to construction and maintenance of SoCalGas's pipeline systems as well as the establishment of programmatic permits to facilitate construction activity in certain areas within the service territory. For example, Forest Service Master Special Use Permits (MSUP) provide safe and efficient access to pipeline facilities and allow for the continued inspection, maintenance, and operation of SoCalGas's pipeline infrastructure within the Angeles National Forest, Los Padres National Forest, and San Bernardino National Forest. SoCalGas is currently completing activities that require Forest Service authorizations by requesting approvals on a case-by-case basis which results in significant and variable demands on resources of both the Forest Service and SoCalGas personnel. The requested MSUP would provide long term, programmatic authorization of Operation & Maintenance activities along all SoCalGas's pipeline and associated access routes within National Forests, which will result in a more efficient process and alleviate the long lead delays arising from the receipt of authorizations and permits.

D. Supervision and Engineering Overhead Pool

TABLE MM-21

GAS ENGINEERING (In 2021 $, in 000s)				
Supervision and Engineering Overhead Pool	**2021 Adjusted-Recorded**	**Estimated 2022**	**Estimated 2023**	**Estimated 2024**
Supervision and Engineering Overhead Pool (Budget Code 9080)	19,463	15,899	15,899	18,899
Total	**19,463**	**15,899**	**15,899**	**18,899**

1. Description of Costs and Underlying Activities

The forecast for Budget Code 9080 for 2022, 2023, and 2024 are $15.9M, $ 15.9M, and $18.9M, respectively. This budget code provides a pool for Supervision and Engineering charges to be made on a direct basis to this capital category that is then reassigned to the various budget categories on an indirect basis. Charges reside in this budget category temporarily and are reassigned monthly. Specific details regarding Supervision and Engineering overheads pool may be found in my capital workpapers (Exhibit SCG-07-CWP).

2. Forecast

The forecast was developed using the three-year average method. The three-year average is reflective of recent activity but still requires a minor adjustment of $3M in 2024 to account for the settling of the cost related to Construction organization that began in 2020.

3. Cost Drivers

The cost drivers include Supervision and Engineering Overhead charges stemming from labor related to capital projects and reassigned to Capital budget categories specific to Gas Transmission projects.

VI. CONCLUSION

The SoCalGas forecast of the O&M expenses and planned capital expenditures presented in my testimony balances compliance obligations, risk, and the cost to deliver natural gas safely and reliably. The forecast relies on a variety of forecasting methodologies including averages, linear, and base-year to reflect the requirements and resources required for each area or group to maintain a safe, reliable, and resilient system.

As a result, SoCalGas requests the Commission adopt SoCalGas's TY 2024 forecast of $33,043,000 for Gas Engineering O&M expenses, which is composed of $16,445,000 for non-shared service activities and $16,598,000 for shared service activities.

In summary, these forecasts reflect sound judgment and represent the impact from higher regulatory expectations to continuously enhance the safety of the SoCalGas natural gas system and provide safe, resilient, and reliable natural gas service at reasonable cost. The Commission should adopt the forecasted expenditures discussed in this testimony because they are prudent and reasonable.

This concludes my prepared direct testimony

VII. WITNESS QUALIFICATIONS

My name is Maria T. Martinez. My business address is 555 W. Fifth Street, Los Angeles, California, 90013. I am employed by SoCalGas as the Gas Engineering Director for SoCalGas and SDG&E. In this position, I am responsible for providing centralized program support for a variety of engineering disciplines, technical expertise on equipment and procedures, company policies, material quality, and material specification for Transmission, Storage, and Distribution. To accomplish this responsibility, I manage an organization of over 300 employees with varying degrees of technical expertise. In addition, I possess a broad background in engineering and natural gas pipeline operations, with twenty years of experience at SoCalGas. I have held numerous positions with increasing responsibilities within Pipeline Integrity, Gas Distribution Operations, and Gas Transmission Operations. I have held my current position as Director of Gas Engineering since December 2020.

I hold a Bachelor of Science degree in Mechanical Engineering from California State Polytechnic University, Pomona. I hold a California Professional Engineering License in mechanical engineering from the state of California.

I have previously testified before the Commission.

APPENDIX A
GLOSSARY OF TERMS

APPENDIX A

Glossary of Terms

Acronym	Definition
BTU	British Thermal Unit
CAD	Computer Aided Drafting
EAC	Engineering Analysis Center
GRC	General Rate Case
FAA	Federal Aviation Administration
MAOP	Maximum allowable operating pressure
MRC	Measurement, Regulation, and Control
MTU	Meter Transmission Unit
NGV	Natural Gas Vehicle
NDE	Non-Destructive Examination
O&M	Operations and Maintenance
PCB	Polychlorinated biphenyl
PHMSA	Pipeline and Hazardous Materials Safety Administration
PRCI	Pipeline Research Council International
PSEP	Pipeline Safety Enhancement Plan
RAMP	Risk Assessment Mitigation Phase
RD&D	Research, Development and Demonstration
SB	Senate Bill
SDG&E	San Diego Gas & Electric Company
SoCalGas	Southern California Gas Company
TY	Test Year

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Exhibit	Witness	Page	Line or Table	Revision Detail
SCG-07	Maria Martinez	MTM-18	17	Changed “Regulatios” to “Regulations”
SCG-07	Maria Martinez	MTM-39	18	Changed Table title from “MM-20” to “MM-21”