Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case
Application: A.22-05-016
Exhibit: SDG&E-04-R

REVISED

PREPARED DIRECT TESTIMONY OF

L. PATRICK KINSELLA

(GAS DISTRIBUTION)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

August 2022

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APPENDICES

SUMMARY

GAS DISTRIBUTION (In 2021 $)			
	2021 Adjusted-Recorded (000s)	**TY2024 Estimated (000s)**	**Change (000s)**
Total Non-Shared Services	36,545	41,843	5,298
Total Shared Services (Incurred)	0	0	0
Total O&M	**36,545**	**41,843**	**5,298**

GAS DISTRIBUTION (In 2021 $)				
	2021 Adjusted-Recorded (000s)	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total Capital	**140,158**	**132,585**	**135,392**	**122,799**

GAS DISTRIBUTION (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total IT Capital	**371**	**632**	**0**

Summary of Requests

In total, San Diego Gas & Electric Company (SDG&E or the Company) requests the California Public Utilities Commission (CPUC or Commission) adopt its Test Year 2024 (TY 2024) General Rate Case (GRC) forecast of $41,843,000 for Gas Distribution operations and maintenance (O&M) expenses. SDG&E further requests the Commission adopt its forecast for capital expenditures in 2022, 2023, and 2024 of $132,585,000, $135,392,000, and $122,799,000, respectively. SDG&E's O&M and capital requests are reasonable and fully justified in that the activities:

- Maintain and enhance the delivery of sustainable, safe, and reliable service to customers;
- Are consistent with operational laws, codes, and standards established by local, state, and federal authorities;
- Support SDG&E's commitment to mitigate risks associated with hazards to customer/public and employee/contractor safety, infrastructure integrity, and system reliability as evident in SDG&E's 2021 Risk Assessment and Mitigation

Phase (RAMP) Report[1] which includes activities discussed throughout this Gas Distribution filing;

- Respond to operations, maintenance, and construction needs associated with projected customer and system growth and the demands of city, county, and state agencies under the Company's franchise agreements;
- Maintain and strengthen a diverse and qualified workforce;
- Support new field technologies and GHG reductions through implementation of Renewable Natural Gas (RNG), Green Hydrogen (H2) and other sustainability opportunities; and
- Support SDG&E's commitment to adapt to more extreme climate fueled events and build a system that will be resilient in the face of these risks.

Also, provided in the capital testimony is the business justification for one information technology (IT) project.

The activities described in my testimony are consistent with local, state, and federal laws, codes, and standards.[2] This work safeguards the long-term safety and integrity of the system and includes compliance, or public safety activities, such as system wide leak surveys, facility inspections, cathodic protection maintenance, pipeline facility maintenance, and monitoring odorant levels. SDG&E anticipates this work to continue to increase as it manages an aging infrastructure and responds to changing regulatory and legislative requirements.

The activities in my testimony maintain the delivery of sustainable, safe, and reliable service to SDG&E's customers. SDG&E prioritizes work to comply with laws and regulations and provide system integrity and reliability, in accordance with SDG&E's commitment to safety:

> San Diego Gas and Electric's longstanding commitment to safety focuses on three primary areas – employee safety, customer safety and public safety. This safety focus is embedded in what we do and is the foundation for who we are – from initial employee training, to the installation, operation and maintenance of our utility infrastructure, and to our commitment to provide safe and reliable service to our customers.[3]

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1 A.21-05-011 SDG&E 2021 Risk Assessment and Mitigation Phase (RAMP) Report (May 17, 2021), *available at:* https://www.sdge.com/proceedings/2021-sdge-ramp-report.

2 Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards, 49 C.F.R. § 192 et seq.; Cal. Gov't Code § 4216 et seq.; General Order (GO) 112-F; and GO 58-A.

3 SDG&E, *2021 Gas Safety Plan* (March 15, 2021) at 9, *available at:* https://www.sdge.com/sites/default/files/regulatory/2021_SDGE%20GasSafetyPlan_Final.pdf.

In addition, my testimony establishes the reasonableness of the cost incurred in executing the ongoing Mobilehome Park Utility Conversion Program (MHP Program). As directed by the Commission in D.14-03-021, SDG&E submits the costs in the Mobilehome Park Utility Conversion Program Report annually and supports the reasonableness in my testimony. Reasonableness review of costs is limited to recorded costs and excludes any program cost forecasts.

REVISED PREPARED DIRECT TESTIMONY OF L. PATRICK KINSELLA (GAS DISTRIBUTION)

I. INTRODUCTION

A. Summary of Gas Distribution Costs and Activities

My testimony supports the TY 2024 forecasts for O&M costs for non-shared services and capital costs, and the business justification for IT capital costs for the forecast years 2022, 2023, and 2024, associated with the Gas Distribution area for SDG&E. In total, SDG&E requests the Commission adopt its TY 2024 forecast of $41,843,000 for non-shared service Gas Distribution O&M expenses. SDG&E further requests the Commission adopt its forecast of capital expenditures for 2022, 2023, and 2024 of $132,585,000, $135,392,000, and $122,799,000, respectively. In addition, my testimony establishes the reasonableness of $195,755,449 ($192,245,123 in capital expenditures and $3,510,326 in O&M expenditures) incurred through 2021 in executing the pilot and now ongoing and Commission approved[4] Mobilehome Park Utility Conversion Program (MHP Program).

Table LPK-1 summarizes my sponsored costs. Table LPK-1A summarizes the IT Capital project costs for which I sponsor the business justification.

TABLE LPK-1
Test Year 2024 Summary of Total Costs

GAS DISTRIBUTION (In 2021 $)			
O&M	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
Total Non-Shared Services	36,545	41,843	5,298
Total Shared Services (Incurred)	0	0	0
Total O&M	**36,545**	**41,843**	**5,298**

[4] On April 16, 2020, the Commission issued D.20-04-004, approving a ten-year Mobilehome Park Utility Conversion Program beginning in 2021 through 2030.

GAS DISTRIBUTION (In 2021 $)				
CAPITAL	**2021 Adjusted-Recorded (000s)**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Non-collectible (NC)		**107,929**	**118,134**	**117,915**
Collectible (CO)		**22,025**	**14,399**	**2,157**
Total CAPITAL	**140,158**	**132,585**	**135,392**	**122,799**

TABLE LPK-1A
Summary of Total Gas Distribution IT Capital Costs

GAS DISTRIBUTION (In 2021 $)			
	Estimated 2022 (000s)	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
Total IT CAPITAL	**371**	**632**	**0**

The purpose of this testimony is to demonstrate the reasonableness of SDG&E's Gas Distribution capital expenditure and expense forecasts to operate and maintain the gas distribution system and construct new gas distribution facilities. SDG&E's philosophy is to provide sustainable, safe, and reliable delivery of natural gas through its pipeline infrastructure to customers at reasonable rates. This commitment requires that SDG&E continue to invest in its employees, pipeline assets, and support services to mitigate risks associated with the safety of the public and employees, system reliability, and infrastructure integrity. Specifically, the activities discussed herein:

- Maintain and enhance the delivery of sustainable, safe, and reliable service to customers;
- Are consistent with operational laws, codes, and standards established by local, state, and federal authorities;
- Support SDG&E's commitment to mitigate risks associated with hazards to customer/public and employee/contractor safety, infrastructure integrity, and system reliability as evident in SDG&E's 2021 Risk Assessment and Mitigation Phase (RAMP) Report which includes activities discussed throughout this Gas Distribution filing;
- Respond to operations, maintenance, and construction needs associated with projected customer and system growth and the demands of city, county, and state agencies under the Company's franchise agreements;

- Maintain and strengthen a diverse and qualified workforce;
- Support new technologies and GHG reductions through implementation of Renewable Natural Gas (RNG), Green Hydrogen (H2) and other sustainability opportunities; and
- Support SDG&E's commitment to adapt to more extreme climate fueled events and build a system that will be resilient in the face of these risks.

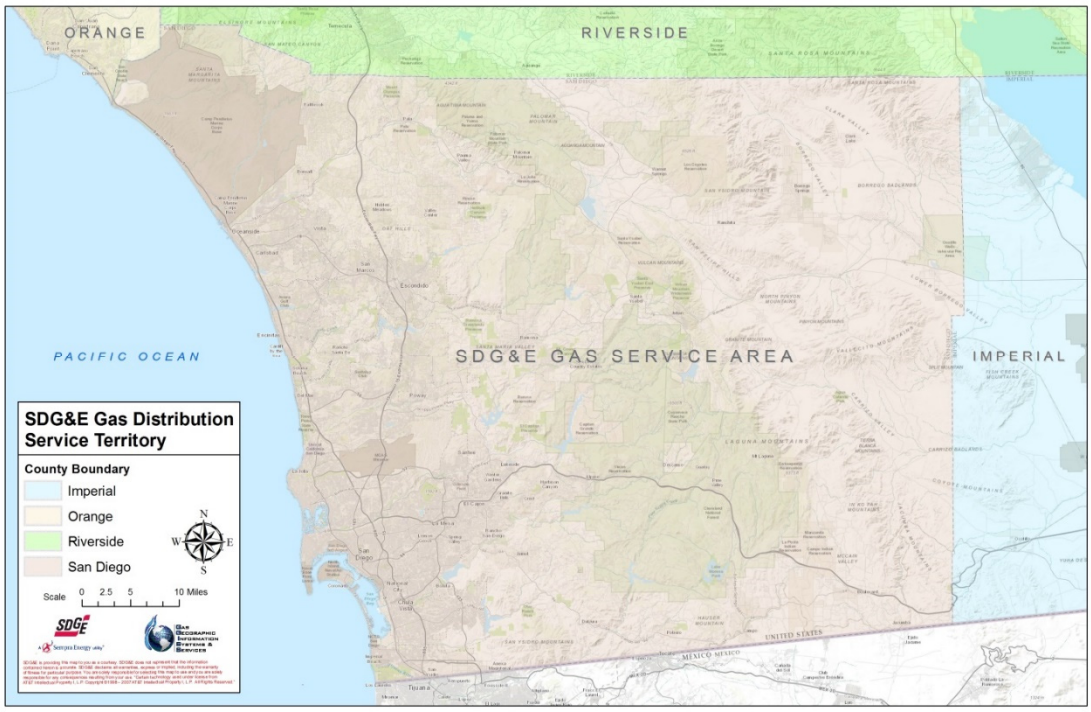
This testimony discusses non-shared expenses in support of O&M functions for gas distribution mains and services, measurement and regulator stations, customer meters, regulators, and supporting electronic equipment and includes the associated engineering, supervision, and technical support. The capital expenditures presented herein are in support of the installation, replacement, and relocation of gas distribution pipeline infrastructure. All costs in this testimony are shown in 2021 dollars, unless otherwise noted.

In addition to this testimony, please refer to my workpapers, Exhibit (Ex.) SDG&E-04-WP (O&M) and SDG&E-04-CWP (Capital) for additional information about the activities described herein.

SDG&E's gas distribution system consists of a network of approximately 15,328 miles[5] of interconnected gas mains, services, and associated pipeline facilities. These mains and services, constructed of both steel and plastic materials in varying diameters, are located in most streets within SDG&E's service territory. The primary function of this distribution pipeline network is to deliver natural gas from SDG&E's transmission system to approximately 900,000 customers in an area of over 1,400 square miles, stretching from Orange County in the north to the Mexico border in the south, as depicted in Figure LPK-01, below.

[5] Total mileage from U.S. Department of transportation Pipeline and Hazardous Material Safety Administration 2021 Annual Report for Calendar Year 2021 Gas Distribution System, OMB NO: 2137-0629.

Figure LPK-01
SDG&E Gas Distribution Service Territory



SDG&E's Distribution network is composed of approximately 8,247 miles of gas mains, which operate at either high pressure (over 60 pounds per square inch (psi)) or medium pressure (60 psi and below). This system contains numerous valves capable of isolating the total system into smaller areas for operational, construction, and emergency purposes. SDG&E operates regulator stations located throughout the system to maintain gas pressure, regulate the distribution system, and provide adequate capacity to meet customer needs. In addition, SDG&E maintains approximately 7,081 miles of service lines. The gas service lines connect the high- and medium- pressure mains to each customer meter set assembly (MSA) and "house pipeline."

SDG&E routinely performs work to maintain the daily operation of the system, connect new customers, maintain the necessary capacity to serve all customers, replace damaged or deteriorating facilities, and relocate facilities to meet customer and governmental agency needs. This workforce ranges from front-line construction crews to technical planners and engineers. There are approximately 596 distribution employees located at five operating bases and one

technical office throughout SDG&E's service territory. These employees are responsible for maintaining safe and reliable operation of the gas distribution system.

My cost forecasts support the Company's goals of continuous improvement while having the ability to provide sustainable, safe, and reliable service of natural gas to customers at reasonable rates, while mitigating risks associated with hazards to customer/public and employee/contractor safety, infrastructure integrity, and system reliability.

SDG&E is committed to continued long-term investment in its pipeline infrastructure to maintain the integrity of its distribution system and comply with applicable local, state, and federal laws and regulations. The Company actively evaluates the condition of its pipeline system through maintenance and operations activities, and replaces pipeline segments to preserve the safe and reliable system customers expect. With the forecasted level of funding, and by continuing to identify ways to improve gas distribution system installation, operation, and maintenance activities, SDG&E anticipates that it can continue to manage these business and operational challenges, and will continue to provide sustainable, safe, and reliable natural gas service at reasonable rates.

SDG&E faces challenges affecting both the physical operation of the pipeline system and cost management aspects of its business that contribute to the forecasts presented in this testimony. These challenges include:

Trained and Qualified Workforce

Safety is rooted in all phases of Gas Distribution training. Maintaining a skilled, qualified, and dedicated workforce is critical to SDG&E's continued success. It is through the efforts of these employees that SDG&E can continue to deliver reliable service to customers and maintain the integrity of its pipeline infrastructure at reasonable cost. SDG&E is experiencing increasing pressure associated with maintaining a highly trained and qualified workforce.

Within the workforce there is turnover, due primarily to retirements and employee movement as a result of promotions and transfers, which continue to pose challenges to SDG&E. In particular, SDG&E is experiencing these challenges in the areas of knowledge transfer, skills development, and overall proficiency of the replacement workforce. Gas Distribution is taking appropriate measures to maintain its highly skilled workforce, recognizing that safety and system reliability cannot be sacrificed during times of employee transition. As new and less experienced employees step in to replace highly skilled employees, SDG&E is mindfully training and

mentoring them, giving them on-the-job experience, and providing greater levels of supervision and quality assurance to instill a continued focus on proficiency and safety.

Furthermore, SDG&E is continuously refining its Operator Qualification (OpQual) program to better align with recommendations by CPUC auditors and industry leading practices, as well as to maintain compliance with GO 112-F. This includes adding new qualification elements, developing qualification materials, managing an electronic recordkeeping process, developing a computer-based training environment to include virtual reality training for difficult-to-replicate real life scenarios, and conducting training to qualify impacted employees.

Aging Infrastructure

SDG&E has a long history of delivering safe and reliable natural gas service, notwithstanding the fact that a significant portion of its pipeline infrastructure has been in service for more than 50 years. Good maintenance practices have allowed SDG&E to safely and reliably operate these pipeline facilities for this extended period. As the Company's pipeline infrastructure continues to age, it requires higher levels of maintenance, which results in higher costs. SDG&E attempts to maintain a reasonable balance between increased maintenance needs and eventual replacement.

In addition to aging pipelines, SDG&E is also addressing the aging of other pipeline infrastructure, such as Measurement and Regulation (M&R) equipment, electronic systems including pressure monitoring and pressure control, and cathodic protection system components, such as anode beds and rectifiers. All components of the gas distribution system have a finite useful life that must be observed, and repairs must be anticipated to avoid service interruptions, non-compliance situations, or adverse safety conditions.

System Expansion

As discussed in the Cost Escalation testimony of Scott Wilder's (Ex. SDG&E-39) gas customer growth is continuing to increase and as such SDG&E's pipeline system continues to expand to meet the needs of the customer base and the need for pipeline infrastructure. New facilities add to the inventory of assets that require operations and maintenance attention. Pipelines must be leak surveyed to monitor asset condition and any identified deficiencies must be corrected. Facilities must be located and marked to minimize potential damage from outside sources. System valves, meters, and regulators must be inspected, operated, and maintained.

Each of these actions must be completed in accordance with federal and state regulations and are critical to maintaining a safe and reliable distribution system.

Customer and Load Demands

As a public utility, SDG&E has an obligation to provide natural gas service to customers within its service territory. As the customer base grows and expands, new demands are placed on existing infrastructure. For example, customer load growth creates the need for facility upgrades; increasing customer density can require the relocation of existing infrastructure: and general business improvements require the Company to protect its infrastructure from potential damage due to third-party construction. Field experience indicates that more favorable economic conditions lead to increases in various work requirements. SDG&E anticipates that as the economy continues to grow with housing demand remaining high,[6] this will impact activities related to customer and load demands.

State and Municipal Agency Construction Requirements

The construction, operation, and maintenance of SDG&E's vast pipeline system requires interaction and compliance with numerous agencies. These agencies continue to impose new and often more stringent administrative, planning, and field construction operating conditions that can result in increased cost pressures to maintain the gas distribution system. This includes increased costs associated with permits, traffic control plans, paving repair requirements, and restricted work hours. SDG&E works diligently with these agencies to find solutions that are in the best interest of customers and agencies. Nevertheless, these rules often result in cost increases.

Regulatory Requirements

The activities described in my testimony are consistent with the operational laws, codes, and standards established by local, state, and federal authorities.[7] These requirements continue to increase, necessitating changes in work processes and the addition of resources to complete

[6] IHS/Markit Global Insight's November 2021 Regional Forecast for San Diego Metro area [San Diego County].

[7] Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards, 49 C.F.R. § 192 et seq.; Cal. Gov't Code § 4216 et seq.; GO 112-F; and GO 58-A.

impacted operations, maintenance, and construction work. Some of these continued pressures are associated with the continued compliance with GO 112-F and implementation of SB 297.

In 2017, GO 112-F, the State of California's code governing the design, construction, testing, operation, and maintenance of natural gas lines became effective. Some of the upward pressures still being experienced today from the updated General Order include:

- Increase leak survey frequency for high-pressure pipelines (DOT-defined 2 transmission lines) from every year to every 6 months. In Gas Distribution, these lines are known as supply lines.
- Additional requirements for managing encroachments, including notifications and development of written plans.
- Additional monitoring, reporting, and recordkeeping, including parsing of leak repair and response time data (*e.g.*, response time to make safe and arrive on scene captured in 5-minute intervals up to 45 minutes, 45-60 minutes, and greater than 60 minutes); continued monitoring and reporting of timeliness to update maps; criteria and notification for over-pressure incidents; and parsing of excavation damage data (*e.g.*, damages and costs related to homeowners).

In addition, SB 661 (Dig Safe Act of 2016) added enforcement to the digging laws by establishing the California Underground Facilities Safe Excavation Board to act against those parties who violate the excavation law under California Government Code Section 4216. In 2021, the California Governor signed SB 297, named the Wade Kilpatrick Gas Safety and Workforce Adequacy Act of 2021. The law makes any contractor that causes damage to a subsurface installation as a result of failing to provide notice of the need for a gas corporation to locate and mark its subsurface installations or commencing excavation before a gas corporation marks its subsurface installations subject to a civil penalty in an amount not to exceed $100,000 and possible suspension or revocation of the contractor's license if specified conditions are met. The State's added enforcement and SB 297's amendments increasing the maximum penalties are expected to compel more excavators to call Underground Service Alert (USA), which will add upward pressure to an already increasing ticket volume in the State.

SDG&E anticipates that the level of funding requested in this testimony will provide the resources needed to comply with these incremental regulatory requirements.

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 Estela de Llanos (Ex. SDG&E-02, Sustainability Policy), Rick Chiapa, Steve Hruby, Aaron Bell

(Ex. SCG-06, Gas Transmission Operations and Construction), Rick Chiapa and Steve Hruby (Ex. SDG&E-06, Gas Transmission Operations and Construction), Amy Kitson and Travis Sera (Ex. SDG&E-09, Gas Integrity Management Programs), Tyson Swetek (Ex. SDG&E-12, Electric Distribution O&M), David H. Thai (Ex. SDG&E-17, Customer Services – Field Operations), Arthur Alvarez (Ex. SDG&E-22, Fleet Services), Kenneth J. Deremer (Ex. SDG&E-31 Safety, Risk & Asset Management Systems), Neena N. Master (Ex. SCG-27, Safety & Risk Management Systems), Wallace Rawls (Ex. SDG&E-05, Gas System Staff & Technology), Brittany Applestein Syz (Ex. SDG&E-24, Environmental Services and San Onofre Nuclear Generating Station (SONGS)), Daniel Castillo (Ex. SDG&E-20, Supply Management, Logistics, & Supplier Diversity), Jason Kupfersmid (Ex. SDG&E-43, Regulatory Accounts), Angel N. Le and Paul D. Malin (Ex. SDG&E-34, Shared Services Billing, Shared Assets Billing, Segmentation, & Capital Reassignments), William J. Exon (Ex. SDG&E-25, Ch 2, Information Technology), Scott Wilder (Ex. SDG&E-39, Gas Customer Forecast), Scott Wilder (Ex. SDG&E-41, Cost Escalation), Greg S. Flores and R. Scott Pearson (Ex. SCG-03/SDG&E-03, Ch 2, RAMP to GRC Integration), and Dane A. Watson (Ex. SDG&E-36, Depreciation).

1. Small Meter and Regulator Purchases

I sponsor the capital costs associated with the purchase of both Gas Distribution and Customer Services meters and regulators. The labor costs associated with the replacement of small meters and regulators, typically at residential and small commercial sites, is addressed by Mr. Thai (Ex. SDG&E-17). Additional information about these capital purchases may be found in Section V.C. (Gas Meters & Regulators (502)) of my testimony.

2. New Meter Set Forecast

Gas Distribution's New Business construction capital costs, and related meter and regulator unit purchases, are driven by the number of new customer meter set installations. Details on the forecast of new meter set installations can be found in the workpapers of Mr. Wilder, Ex. SDG&E-39-WP. Additional information about the forecasts of new meter sets may be found in Section V.C (New Business (500)) of my testimony.

3. Incremental Vehicles

In order to perform the incremental work associated with the forecasted level of O&M and capital activities, SDG&E is adding vehicles, as required, within applicable workgroups and

capital budget codes. The costs associated with these vehicles are addressed in Mr. Alvarez's testimony (Ex. SDG&E-22).

4. Electric Support

Labor and non-labor expenses are incurred by Gas Distribution crews that have been specially trained to provide traffic control support services for Electric Distribution crews performing Corrective Maintenance Program Inspections. Additional information about the electric Corrective Maintenance Program is addressed by Mr. Swetek (Ex. SDG&E-12).

5. Economic Growth

Gas Distribution relied on total employment growth, as reported by IHS Global Insight, as a directional indicator for general economic conditions and potential economic growth. This IHS Global Insight[8] employment forecast is shown in the workpapers of Mr. Wilder (Ex. SDG&E-39-WP).

6. Environmental Services

Gas Distribution plays a key role in the SDG&E Sustainability goals as covered by Ms. Estela de Llanos, Ex. SDG&E-02. Leak surveys to find and repair leaks in a timely manner help to reduce fugitive emissions from the natural gas distribution system.

7. Asset Integrity Management

Labor expenses are incurred in my witness area in support of Asset Integrity Management's drive towards an enterprise-wide system. Additional information about the Asset Integrity Management Program is addressed by Mr. Kenneth Deremer (Ex. SDG&E-31).

8. SoCalGas Gas System Staff & Technology

Gas Distribution receives support from a centralized staff organization within Gas System Staff & Technology. The support activities provided by this group are discussed by Mr. Wallace Rawls (Ex. SDG&E-05 and SCG-05). These activities include Gas Standards development and maintenance; Damage Prevention and Public Awareness Programs management; and tool and technology research and implementation.

[8] IHS/Markit Global Insight's November 2021 Regional Forecast for San Diego Metro area [San Diego County].

C. Organization of Testimony

My testimony is organized as follows:

- Introduction;
- Risk Assessment Mitigation Phase (RAMP) Integration;
- Sustainability and Safety Culture;
- Non-Shared Costs;
- Capital;
- Mobilehome Park Utility Conversion Program Recovery;
- Conclusion;
- Witness Qualifications.

II. RISK ASSESSMENT MITIGATION PHASE (RAMP) INTEGRATION

Certain costs supported in my testimony are driven by activities described in SoCalGas and SDG&E's respective 2021 Risk Assessment Mitigation Phase (RAMP) Reports (the 2021 RAMP Reports).[9] The 2021 RAMP Reports presented an assessment of the key safety risks for SoCalGas and SDG&E and proposed plans for mitigating those risks. As discussed in the testimony of the RAMP to GRC Integration witnesses R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2), the costs of risk mitigation projects and programs were translated from the 2021 RAMP Reports into the individual witness areas.

In the course of preparing the Gas Distribution GRC forecasts, SDG&E continued to evaluate the scope, schedule, resource requirements, and synergies of RAMP-related projects and programs. Therefore, the final presentation of RAMP costs may differ from the ranges shown in the 2021 RAMP Reports. Table LPK-2 and Table LPK-3 provide summaries of the RAMP-related costs supported in my testimony.

[9] *See* Application (A.) 21-05-011/-014 (cons.) (RAMP Proceeding). Please refer to the RAMP to GRC Integration testimony of R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Ch. 2) for more details regarding the 2021 RAMP Reports.

TABLE LPK-2
Summary of RAMP O&M Costs (In 2021 $)*

GAS DISTRIBUTION			
	BY2021 Embedded Base Costs (000s)	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**
RAMP Risk Chapter			
SDG&E-Risk-7 Excavation Damage (Dig-In) on the Gas System	7,862	10,843	2,981
SDG&E-Risk-8 Incident Involving an Employee	441	441	0
SDG&E-Risk-9 Incident Related to the Medium Pressure System (Excluding Dig-in)	14,672	15,998	1,326
Sub-total	22,975	27,282	4,307
RAMP Cross-Functional Factor (CFF) Chapter			
SDG&E-CFF-1 Asset Management	0	110	110
SDG&E-CFF-6 Records Management	591	649	58
Sub-total	591	759	168
Total RAMP O&M Costs	**23,566**	**28,041**	**4,475**

*CFF-related information, in accordance with the March 30, 2022 Assigned Commissioner Ruling in A.21-05-011/-014 (cons.), is provided in the RAMP to GRC Integration testimony of R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Chapter 2).

TABLE LPK-3
Summary of RAMP Capital Costs (In 2021 $)*

GAS DISTRIBUTION				
	2022 Estimated RAMP Total (000s)	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**2022-2024 Estimated RAMP Total (000s)**
RAMP Risk Chapter				
SDG&E-Risk-3 Incident Related to the High-Pressure System (Excluding Dig-in)	2,192	1,891	0	4,083
SDG&E-Risk-7 Excavation Damage (Dig-In) on the Gas System	225	225	225	675
SDG&E-Risk-9 Incident Related to the Medium Pressure System (Excluding Dig-in)	46,695	51,344	51,902	150,166
Sub-total	49,112	53,460	52,127	154,924
RAMP Cross-Functional Factor (CFF) Chapter				
SDG&E-CFF-6 Records Management	1,298	1,395	1,385	4,078
Sub-total	1,298	1,395	1,385	4,078
Total RAMP Capital Costs	**50,410**	**54,855**	**53,512**	**159,002**

*CFF-related information in accordance with the March 30, 2022 Assigned Commissioner Ruling in A.21-05-011/-014 (cons.) is provided in the RAMP to GRC Integration testimony of R. Scott Pearson and Gregory S. Flores (Ex. SCG-03/SDG&E-03, Ch. 2).

A. RAMP Risk and Cross-Functional Overview

As summarized in Table LPK-2 and Table LPK-3 above, my testimony includes costs to mitigate the risks and cross-functional factors (CFFs) included in the 2021 RAMP Report.[10] These risks and CFFs are further described in Table LPK-4 below:

[10] Unless otherwise indicated, references to the 2021 RAMP Report refer to SDG&E's respective RAMP Report.

TABLE LPK-4
RAMP Risk and CFF Chapter Descriptions

SDG&E-Risk-3 – Incident Related to the High-Pressure System (Excluding Dig-in)	This chapter addresses the risk of incident related to the high-pressure system resulting in serious injuries or fatalities and/or damage to infrastructure and/or private property.
SDG&E-Risk-7 – Excavation Damage (Dig-In) on the Gas System	This chapter addresses the risk of Excavation damage on the Gas System resulting in serious injuries or fatalities and/or damage to infrastructure and/or private property.
SDG&E-Risk-8 – Incident Involving an Employee	This addresses the risk of an incident, involving one or more on-duty employees, that causes serious injury or fatality to a company employee.
SDG&E-Risk-9 – Incident Related to the Medium-Pressure System (Excluding Dig-in)	This chapter addresses the risk of incident related to the medium-pressure system resulting in serious injuries or fatalities and/or damage to infrastructure and/or private property.
SDG&E-CFF-1 Asset Management	An enterprise-wide framework that provides a standardized approach for managing risk and safety across assets and activities. The framework integrates people, processes, data, and technology to enable data-driven decision making through governance, strategy, data consolidation and analytics, and continuous improvement.
SDG&E-CFF-6 Records Management	Describes how inadequately maintained records can have impacts on employee and public safety as well as reliability.

In developing my request, priority was given to these key safety risks to assess which risk mitigation activities Gas Distribution currently performs and what incremental efforts are needed to further mitigate these risks. While developing the GRC forecasts, SDG&E evaluated the scope, schedule, resource requirement, and synergies of RAMP-related projects and programs to

determine costs already covered in the base year and those that are incremental increases expected in the test year.

Messrs. Pearson and Flores (Ex. SCG-03/SDG&E-03, Chapter 2) discuss all risks and CFFs included in the 2021 RAMP Reports and the RAMP to GRC integration process.

B. GRC Risk and CFF Activities

Table LPK-5 below provides a narrative summary of the forecasted RAMP-related activities that I sponsor in my testimony.

TABLE LPK-5
Summary of RAMP and CFF Activities

RAMP ID	Activity	Description
SDG&E-Risk-3-M04	Adobe Falls Relocation Project	The Adobe Falls Relocation Project will eliminate steep and risky paths for mandated periodic leak survey, and access for maintenance or response for emergency repairs.
SDG&E-Risk-7-C01	Locate and Mark Training	Locate and Mark (L&M) Training covers training for employees who perform the L&M activities, Annual refresher, Operator Qualification, and Company Excavator Training
SDG&E-Risk-7-C03	Locate and Mark Activities – MP	L&M Activities involves locating and marking underground medium-pressure gas and electric facilities before excavation occurs.
SDG&E-Risk-7-C04	Locate and Mark Activities – HP	L&M Activities involves locating and marking underground high-pressure gas facilities before excavation occurs and observing (stand-by) pipeline excavation activities.
SDG&E-Risk-7-C09	Locate and Mark Quality Assurance	L&M Quality Assurance Program is to validate locators are following processes and procedures when performing locating tasks.
SDG&E-Risk-7-C04	Locating Equipment	Locating Equipment is providing hardware that is appropriate for the rugged outdoor environment and updated with the latest software to run efficiently and provide correct information to locate underground pipelines accurately
SDG&E-Risk-8-C10	Personal Protective Equipment	Personal Protective Equipment protects employees from the risk of injury by creating a barrier against workplace hazards.
SDG&E-Risk-9-C01	Cathodic Protection – O&M	Cathodic Protection (CP) constitutes the O&M activities that provide compliance to regulations and supports the safety and integrity of the gas system.

RAMP ID	Activity	Description
SDG&E-Risk-9-C02	Cathodic Protection – Capital	CP constitutes the capital expenditures associated with the installation of new and replacement CP infrastructure systems and equipment in accordance with regulations.
SDG&E-Risk-9-C03	Piping in Vaults Replacement Program	Piping in Vaults Replacement Program is the replacement of piping located in underground vaults.
SDG&E-Risk-9-C04	Regulator Station, Valve, and Large Meter Set Inspection	Regulator Station, Valve, and Large Meter Set Inspection is for inspections and maintenance to regulator stations, critical valves, and large meter sets.
SDG&E-Risk-9-C05	Regulator Station Replacements	Regulator Station Replacements is the proactive replacement of regulator stations prior to the end of their useful life in order to reduce overall system risk.
SDG&E-Risk-9-C06	Leak Repair	Leak Repair is the repair of natural gas leaks in the system.
SDG&E-Risk-9-C07	Pipeline Monitoring (Leak Mitigation, Bridge & Span, Unstable Earth, and Pipeline Patrol)	Pipeline Monitoring (Leak Mitigation, Bridge & Span, Unstable Earth, and Pipeline Patrol) is conducting pipeline monitoring and inspection activities to proactively target risk factors before operation and safety issues arise.
SDG&E-Risk-9-C08-T1	Underperforming Steel Replacement Program – Threaded Main (pre-1934 vintage)	Underperforming Steel Replacement Program –Threaded Main (pre-1934 vintage) mitigates the potential for gas leakage due to the proactive replacement of vintage threaded steel mains and services.
SDG&E-Risk-9-C08-T2	Underperforming Steel Replacement Program (1934-1965 vintage)	Underperforming Steel Replacement Program (1934-1965 vintage) focuses on the proactive replacement of poorly performing steel installed between 1934 and 1965.
SDG&E-Risk-9-C08-T3	Underperforming Steel Replacement Program – Other Steel (Post 1965 vintage)	Underperforming Steel Replacement Program – Other Steel (Post 1965 vintage) focuses on the proactive replacement of poorly performing steel post 1965.
SDG&E-Risk-9-C09-T1	Early Vintage Program (Components) – Oil Drip Piping Removal	Early Vintage Program (Components) – Oil Drip Piping Removal is the removal of Oil Drip Piping that is no longer necessary and is at risk of excavation damage.
SDG&E-Risk-9-C09-T2	Early Vintage Program (Components) – Dresser Mechanical Coupling Removal	Early Vintage Program (Components) – Dresser Mechanical Couplings Removal is the removal of Dresser Coupling with welded pipe. These couplings are typically located in highly populated areas.
SDG&E-Risk-9-C09-T3	Early Vintage Program (Components) – Removal of Closed Valves between High/Medium Pressure Zones	Early Vintage Program (Components) – Removal of Closed Valves between High/Medium Pressure Zones is the removal of closed valves between high pressure (HP) and medium pressure (MP) system. Having a closed valve between HP and MP system is no longer an accepted practice.
SDG&E-Risk-9-C10	Code Compliance Mitigation	Code Compliance Mitigation consists of upgrades or additions to facilities to maintain compliance with

RAMP ID	Activity	Description
		minimum federal safety standards for gas pipelines in 49 C.F.R. § 192 and state safety standards in GO 112-F.
SDG&E-Risk-9-C11	Gas Distribution Emergency Department	Gas Distribution Emergency Department is an organization consisting of two person crews dedicated to responding to gas emergencies to improve gas emergency response and control times.
SDG&E-Risk-9-C12	Cathodic Protection System Enhancements	Cathodic Protection (CP) System Enhancements tracks projects specifically associated with creating dedicated high-pressure and medium-pressure distribution pipeline CP systems.
SDG&E-Risk-9-C13	Human Factors Mitigations – Gas Handling Plans	Human Factors Mitigations – Gas Handling Plans are site specific documents with detailed procedures and graphical flow depictions describing the step-by-step processes, to "handle" the diversion of gas flow.
SDG&E-Risk-9-C14	Human Factors Mitigations – Operator Qualification Training and Certification	Human Factors Mitigations – Operator Qualification Training and Certification promotes adherence to proper company policy and procedures and therefore mitigates the risk of hazardous conditions developing and increases the overall awareness and response to unsafe activities
SDG&E-Risk-9-C15	Human Factors Mitigations - QA/QC Program – Mandated Compliance Activities	Human Factors Mitigations - QA/QC Program – Mandated Compliance Activities are performed on various pipeline operational activities as mandated by 49 CFR § 192.605 (b8) (c4).
SDG&E-Risk-9-C17	Control Center Modernization (CCM) Distribution Field Asset Real Time Monitoring and Control Site Installations/Upgrades & New Control Room Technologies	Control Center Modernization (CCM) Distribution Field Asset Real Time Monitoring and Control Site Installations/Upgrades & New Control Room Technologies will enhance distribution field assets by installing control and real time pressure monitoring capabilities, increase operational awareness to quickly identify abnormal operating pressures, and improve remote control functionality.
SDG&E-Risk-9-C19	Field and Public Safety	Field and Public Safety involves the purge orders to promote customer safety by confirming customer owned gas house lines are safe and leak-free and odorant is readily detectable.
SDG&E-Risk-9-M02	Cathodic Protection System Enhancements – Real Time Monitoring	Cathodic Protection System Enhancements – Real Time Monitoring involves the installation of remote monitoring units (RMUs) to monitor the level of CP provided by rectifier stations to the steel pipeline system.
SDG&E-Risk-9-M03	Replace Curb Valves with Excess Flow Valves (EFV)	Replace Curb Valves with EFVs involves the replacement of curb valves with EFV's based on inaccessibility issues.
SDG&E-Risk-9-New	Meter Set Assemblies (MSA) Inside Buildings and Alcoves	MSA's Inside Buildings and Alcoves is a result of new federal guidance to move all MSA's out of buildings and alcoves.

RAMP ID	Activity	Description
SDG&E-CFF-1	Gas Asset Integrity Management	Gas Asset Integrity Management is focused on the development of gas operation models and asset management plans that align with various functional areas of risk, gas planning and operations, financial planning, asset management and portfolio management.
SDG&E-CFF-6	Geographic Information System	Geographic Information System is the gas system of record for pipeline mapping data.

These activities are discussed further below in Section IV.B through Section V.W, as well as in my workpapers. For additional information and a roadmap, please refer to Appendix B, which contains a table identifying by workpaper the TY 2024 forecast dollars associated with activities in the 2021 RAMP Report that are discussed in this testimony.

The RAMP risk mitigation efforts are associated with specific actions, such as programs, projects, processes, and utilization of technology. For each of these mitigation efforts, an evaluation was made to determine the portion, if any, that was already performed as part of historical activities (*i.e.*, embedded base costs) and the portion, if any, that was incremental to base year activities. Furthermore, for the incremental activities, a review was completed to determine if any portion of incremental activity was part of the workgroup's base forecast methodology. The result is what SDG&E considers to be a true representation of incremental increases over the base year.

My incremental request supports the ongoing management of these risks that could pose significant safety, reliability, and financial consequences.

C. Changes from RAMP Report

As discussed in more detail in the RAMP to GRC Integration testimony of Messrs. Pearson and Flores (Ex. SCG-03/SDG&E-03, Chapter 2), in the RAMP Proceeding, the Commission's Safety Policy Division (SPD) and intervenors provided feedback on the Companies' 2021 RAMP Report. Appendix B in Ex. SCG-03/SDG&E-03, Ch. 2 provides a complete list of the feedback and recommendations received and the Companies' responses.

Other than as discussed below, the RAMP-related activities described in my GRC testimony are consistent with the activities presented in the 2021 RAMP Report. General changes to risks scores or Risk Spend Efficiency (RSE) values are primarily due to changes in the Multi-Attribute Value Framework (MAVF) and RSE methodology, as discussed in the RAMP to GRC Integration testimony.

Changes from the 2021 RAMP Report presented in my testimony, including updates to forecasts and the amount and timing of planned work are summarized as follows:

- In response to stakeholder feedback received in the RAMP Proceeding, SDG&E performed additional "tranching" analysis at a more granular level for some of the risk mitigations described in my testimony.[11] SDG&E identified six new tranches in this GRC for high-pressure, medium-pressure, mains, services, steel, and plastic, as compared to the 2021 RAMP Report.
- Four of the Locate and Mark training activities (SDG&E-07, C01; C05; C07; and C25) were presented as discrete controls in the 2021 RAMP Report. However, for purposes of the GRC, SDG&E has incorporated those into one activity (C01). Please see Table LPK-26.
- Two of the Locate and Mark activities (SDG&E-07-C03 and C21) were presented as discrete controls in the 2021 RAMP Report. However, for purposes of the GRC, SDG&E has incorporated those into one activity (C03). Please see Table LPK-11.
- Two of the Locate and Mark activities (SDG&E-07-C23 and C27) were presented as discrete controls in the 2021 RAMP Report. However, for purposes of the GRC, SDG&E has incorporated those into the Underperforming Steel pipe replacement activities (SDG&E-09-C08-T1, T2, T3). Please see Table LPK-50, 52, and 54.
- RAMP Mitigation SDG&E-09-M02 was presented as a discrete new mitigation in the 2021 RAMP Report. However, for purposes of the GRC, SDG&E has incorporated those dollars into SDG&E-09-C12 Cathodic Protection Enhancements (12551).
- After the 2021 RAMP Report had been filed, SDG&E performed a detailed review of its risk mitigation programs. SDG&E determined that one additional program, the mitigation of MSA's in Buildings and Alcoves, was warranted. Accordingly, this project is included in my testimony. Further, for one activity that was presented in the 2021 RAMP Report (SDG&E-Risk-9-M01), SDG&E is not seeking funding in this GRC.

III. SUSTAINABILITY AND SAFETY CULTURE

A. Sustainability

Sustainability, safety, and reliability are the cornerstones of SDG&E's core business operations and are central to SDG&E's GRC presentation. SDG&E is committed to not only deliver clean, safe, and reliable electric and natural gas service, but to do so in a manner that

[11] "Tranching" refers to a logical disaggregation of a group of assets (physical or human) or systems into subgroups with like characteristics for purposes of risk assessment. D.18-12-014 at 18.

supports California's climate policy, adaptation, and mitigation efforts. In support of the legal and regulatory framework set by the state, SDG&E has set a goal to reach Net Zero greenhouse gas (GHG) emissions by 2045, adopted a Sustainability Strategy to facilitate the integration of GHG emission reduction strategies into SDG&E's day-to-day operations and long-term planning, and published an economy-wide GHG Study that recommends a diverse approach for California leveraging clean electricity, clean fuels, and carbon removal to achieve the 2045 goals through the lens of reliability, affordability, and equity. The Sustainability Strategy serves as SDG&E's guide to enable a more just and equitable energy future in SDG&E's service territory and beyond. As a "living" strategy, SDG&E will continue to update the goals and objectives as technologies, policies, and stakeholder preferences change. See the Sustainability Policy testimony of Estela de Llanos (Ex. SDG&E-02).

In this GRC, SDG&E focuses on three major categories that underpin the Sustainability Strategy: mitigating climate change, adapting to climate change, and modernizing the gas infrastructure to be a reliable and resilient catalyst for clean energy. SDG&E's goal is to contribute to the decarbonization of the economy by way of diversifying energy resources, collaborating with regional partners, and providing customer choice that enables an affordable, flexible, and resilient grid.

Nearly all of the activities described in further detail in this testimony advance the state's climate goals and align with SDG&E's Sustainability Strategy. Specifically, Locate & Mark, Leak Repair, Cathodic Protection, Underperforming Steel Replacement Programs, Early Vintage Program (Components) and Control Center Modernization (CCM)[12] drive progress in the areas of Climate Mitigation and Modernizing the Gas Infrastructure. Execution of these programs remains consistent with SDG&E's Sustainability and Safety Culture goals. The safety benefits of these programs are well-established as SDG&E is currently implementing these programs in response to federal and state regulatory requirements. While these initiatives were originally driven by safety, these activities reduce fugitive emissions associated with leaks on the system, including the significant emissions resulting from potential excavation damage (Dig-In); maintain the integrity of SDG&E gas infrastructure; and modernize the natural gas infrastructure

[12] *See* Gas Transmission Operations and Construction testimony of Messrs. Chiapa and Hruby (Ex. SDG&E-06) and Measurement & Regulation (1GD007) and Control Center Modernization (CCM) Project (21574) work group in L. Patrick Kinsella's testimony (Ex. SDG&E-04).

(*e.g.*, steel pipe replacements, component replacements and CCM) to develop a comprehensive, real-time view of this infrastructure with enhanced remote monitoring, control, automation, and analytic capabilities.

B. Safety Culture

SDG&E's longstanding commitment to safety focuses on three primary areas: (1) employee/contractor safety, (2) customer/public safety, and (3) the safety of the gas delivery system. This safety focus is embedded in what SDG&E does. Through this focus and the recent addition of the Gas Safety Center, Gas Distribution has built a Culture of Safety which is the foundation for who SDG&E is– from initial employee training, to the installation, operation, and maintenance of SDG&E's utility infrastructure, and to its commitment to provide resilient, safe, and reliable service to customers at reasonable rates. SDG&E regularly assesses its safety culture and encourages two-way communication between employees and management as a means of identifying and managing safety risks. In addition to the reporting of pipeline and occupational safety incidents, there are multiple methods for employees to report close calls/near misses. At SDG&E, safety is a core value. The Company provides all employees with the training necessary to safely perform their job responsibilities, such as the continuous Smith Driving System refresher course, regular discussion on Illness Prevention, regular enforcement of "Stop the Job, Stop the Task", close call reporting, and the importance of using Personal Protection Equipment.

With Safety at its core, in 2020, SDG&E commenced development and deployment of a Safety Management System (SMS) which better aligns and integrates safety management, risk management, asset management, and emergency management across the entire organization. The SMS takes a holistic approach to "safety" and expands beyond traditional occupational safety principles to include public safety, asset safety, system safety, cyber safety, and psychological safety for improved safety performance and culture. SDG&E's SMS is a systematic, enterprise-wide framework to collectively manage and reduce risk and promote continuous improvement in safety performance through deliberate, routine, and intentional processes. SDG&E adopted a de-centralized SMS organizational structure where risk and accountability is retained at the operational level. The SMS Executive-level and Director-level teams bring cross-functional leaders together to share safety best practices, lessons learned and opportunities for improvement. The Director – Gas Operations serves as a SMS Governance

Team member and has identified operational support across the districts and departments within the organization to operationalize the SMS processes.

Risk- and safety-related activities discussed within my witness testimony are further enhanced within SDG&E's SMS. Business ownership, accountability, and support provide the foundation for the SMS framework. The SMS affirms, aligns, integrates, and brings further awareness and engagement to such programs by providing increased leadership safety engagement, awareness, communication, and transparency; the broad sharing of information and utilization of lessons learned; enhanced documentation in the form of standardized processes with widely accessible document and data repositories; strengthened employee feedback mechanisms with consistent processes for follow-up and remediation; early identification of risks with increased data analytics; and on-going review and assessment to determine program effectiveness and identify opportunities for continuous safety improvement. Refer to the testimony of Ken Deremer (Ex. SDG&E-31) for additional details of SDG&E's SMS.

As noted in the 2021 RAMP Report, excavation damages pose a great hazard to the system and the safety of the communities SDG&E serves. As explained above, public safety is a top priority for SDG&E. Gas Distribution O&M covers the management of the programs designed to mitigate the frequency and impact of excavation damages. Additionally, SDG&E responds to any emergencies to its infrastructure. The Emergency Operations Center, the Distribution Emergency Centers, and the Transmission Command Center activate as needed to monitor, coordinate, communicate, and support the field crews and personnel responding to emergencies.

SDG&E takes an integrated approach to pipeline safety and integrity, beginning with the design and the construction of facilities, followed by continual evaluation and improvement of operations and maintenance activities, public communication and awareness, emergency response, safety programs and practices, the implementation of new technologies, the defined procurement processes that facilitate materials traceability, and a workplace that encourages continual open and informal discussion of safety-related issues. On a daily basis, O&M and capital work elements are managed based on a variety of risk factors and work drivers, such as federal and state regulatory requirements, customer and pipeline growth expectations, franchise obligations, permitting requirements, and conditions found during inspections. These work elements are prioritized first based on immediate safety and compliance considerations, and then,

work is actively prioritized considering factors such as regulatory compliance deadlines, customer scheduling requirements, and overall infrastructure condition. Safety and compliance considerations are captured throughout the Company's policies and procedures.

Generally, examples of O&M activities categorized as safety and compliance include: leak survey and patrols; leak repairs; locate and mark, and stand-by observations; inspections of valves, bridges, spans, and M&R facilities; and maintenance of CP systems. These elements are generally prioritized ahead of work that can be safely managed to occur within a more flexible schedule. For example, in the case of Code 1 (hazardous) leaks, Gas Emergency Department crews are required to take immediate and continuous action until the hazard has been mitigated. Activities with more flexible schedules that are also required to safeguard the integrity of the pipeline system include: main and service alterations; compliance work self-audits; and employee training. Additionally, there are a number of support activities necessary to complete work, including dispatch and work scheduling; supervision; technical support; tools; technology systems; and quality assurance.

In addition to O&M activities, to maintain safe and reliable service, SDG&E makes a variety of capital improvements, including pressure betterment projects to improve areas of low pressure, pipeline renewals to replace deteriorated pipelines or obsolete equipment, installations and replacements of cathodic protection systems, and the purchase of electronic monitoring devices for pressure tracking. The specific factors considered in the prioritization process of capital work that is performed to mitigate these risks may vary depending on the type of project. The prioritization of pipeline projects (*e.g.*, mains, services, cathodic protection, valves, and regulator station replacements) is driven by a review of maintenance activities and findings, results of field workforce inspections, and records of condition. These inspection evaluation elements coupled with computational modeling are used to help mitigate risk and determine replacement needs.

Other factors considered for the replacement of assets include the age of the infrastructure, general equipment reliability, and/or design obsolescence. In addition, during the evaluation of distribution main and service replacements, field and technical staff consider the results from a computational model used to help assess the risk rank of pipeline segments.

Since capital work is dynamic, ongoing assessment of system operations is necessary. For example, construction timelines can be affected by permitting, material availability,

customer schedules, other construction-related factors, and/or additional work requirements that may arise throughout the year in response to maintenance, inspection, and other routine activities. These real-time operational situations are considered when evaluating and subsequently addressing daily distribution pipeline safety and reliability risks.

Not only does an effective safety culture make known its responsibilities and objectives, it requires tangible acts to build and maintain a qualified workforce and to mitigate risks associated with public and employee safety hazards, system integrity, and reliability. The Operator Qualification (OpQual) program in Gas Distribution addresses employee training, qualifications, and work quality. It is an integral part of an overall workforce proficiency effort and key to SDG&E's safety culture. OpQual compliance is closely monitored and employees are trained whenever significant changes occur. The OpQual program aligns with the recommendations by the CPUC auditors and industry leading practices, and it complies with SB 705, which requires pipeline operators to establish and update a Gas Safety Plan that is consistent with leading practices and federal statutes.

SDG&E remains focused on identifying and implementing the most cost-effective solutions with the potential to make the greatest impact on reducing GHG emissions, while maintaining a safe and reliable energy system. SDG&E believes that safety, reliability, and sustainability are inextricably linked and fundamental to the Company's ability to continue to successfully operate. Please see the Sustainability Policy testimony of Ms. Llanos (Ex. SDG&E-02) for additional detail on SDG&E's Sustainability Strategy and the Safety, Risk and Asset Management testimony of Mr. Deremer (Ex. SDG&E-31) for additional detail of SDG&E's Safety Policy.

IV. NON-SHARED COSTS

"Non-Shared Services" are activities that are performed by a utility solely for its own benefit. Corporate Center provides certain services to the utilities and to other subsidiaries. For purposes of this general rate case, SDG&E treats costs for services received from Corporate Center as Non-Shared Services costs, consistent with any other outside vendor costs incurred by the utility.

Operations and Maintenance (O&M) activities are routinely performed on over 15,328 miles of gas distribution main and service pipeline and associated facilities in response to federal

and state regulatory agency codes and standards,[13] customer and pipeline growth expectations, franchise obligations, and to sustain safe and reliable operation of the pipeline system. This work includes leakage surveys, leak repairs, maintenance on mains and services, application of corrosion control measures, valve maintenance, regulator station maintenance, monitoring meter accuracy, gas odorant monitoring, supervision, and training for these O&M activities, and locating and marking buried infrastructure to avoid damage caused from excavation by others. In addition, there is a variety of supporting work necessary to complete this field operations and maintenance work. Examples of support work include: maintaining pipeline maps and related gas system attribute information, administering and implementing city permitting and traffic control requirements, and maintaining engineering models of system flows and pressures. Investment in these activities supports SDG&E's commitment to mitigate risks associated with hazards to public and employee safety, infrastructure integrity, and system reliability.

The level of funding requested in this testimony is consistent with continuing compliance with the pipeline safety regulations and the continued safe and reliable operation of SDG&E's gas distribution pipeline system.

Spending to comply with federal Distribution Integrity Management Program (DIMP) regulations governing distribution pipeline integrity is addressed by Ms. Kitson and Mr. Sera (Ex. SDG&E-09).

Spending associated with gas operations staff support, Gas Standards development and maintenance; the management of the Damage Prevention and Public Awareness Programs; and tools and technology research and implementation is addressed by Mr. Rawls (Ex. SG&E-05).

Unique cost centers are used to record the cost of O&M activities performed within Gas Distribution operations. Collectively, more than 45 cost centers are used in recording the costs presented within this testimony. To facilitate the analysis of historical spending and to complete an evaluation of the projected expenditures, these cost centers are aggregated into 11 "workgroups" representing similar functions and/or having similar cost drivers.

Included in this section of my testimony are the activities and the associated O&M expenses to address the physical condition of the gas distribution system. Gas distribution

[13] Transportation of Natural and Other Gas By Pipeline: Minimum Federal Safety Standards, 49 C.F.R §192 *Et seq*.; Cal. Gov't Code §4216 *et seq*.; GO 112-F; and GO 58-A.

activities are performed from a regional organizational structure. Similar activities are completed at five operating bases located throughout the 1,400 square-mile service territory. These activities can be described as preventative, corrective, or supportive in nature. Preventative work is generally completed on a scheduled basis. It includes the activities and associated costs presented within the workgroups of Locate and Mark, Leak Survey, and M&R. Corrective work is generally reactive to a situation or a facility condition. This includes the activities and the associated costs presented in the workgroups of Cathodic Protection, Main Maintenance, and Service Maintenance. Finally, supportive elements are necessary to complete work assignments and include the activities and the associated costs discussed in Operations Management and Training, Electric Support, Tools, Materials and Fittings, and other Services workgroups.

In preparing projections of the TY 2024 requirements, SDG&E Gas Distribution reviewed historical spending levels, including units of work, and developed an assessment of future requirements and associated risks. This analysis entailed a review of the historical 2017 through 2021 spending with consideration of the underlying cost drivers. Depending on future expectations for the underlying cost drivers, a primary forecast methodology was selected. Selected methodologies include forecasting based on historical averages, simple linear trending of historical data, and 2021 adjusted recorded base year spending. In addition, work requirements that are incremental to levels of historical spending and necessary to maintain the safe and reliable operation of the distribution system and supporting work processes were identified. An analysis was then performed to determine the funding requirement of these new or more-extensive work elements. The overall result is a forecast that has its foundation based on the historical representation, to which incremental expense requirements have been added.

In summary, Gas Distribution requests the Commission adopt a TY 2024 forecast of O&M expenses for non-shared services of $41,843,000, as summarized in Table LPK-6 below. This is an increase of $5,298,000 over the 2021 adjusted recorded base. This increase is driven by Locate and Mark, system expansion, infrastructure renewal, field technical skills and training, improved documentation and control of pipeline materials, and the integration of new technology. Table LPK-6 below summarizes the total non-shared O&M forecasts for the listed cost categories.

TABLE LPK-6
Non-Shared O&M Summary of Costs

GAS DISTRIBUTION (In 2021 $)			
Categories of Management	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
A. Other Services	69	90	21
B. Leak Survey	2,067	2,067	0
C. R-Locate & Mark	7,116	10,096	2,980
D. Main Maintenance	5,009	5,822	813
E. Service Maintenance	3,293	4,116	823
F. Tools	1,708	1,667	-41
G. Electric Support	514	495	-19
H. Measurement & Regulation	4,638	5,153	515
I. Cathodic Protection	2,050	1,834	-216
J. Asset Management	1,078	1,375	297
K. Operations Management, Supervision, & Training	9,003	9,128	125
Total Non-Shared Services	**36,545**	**41,843**	**5,298**

The Commission should find this forecast reasonable and fully justified in that: (1) the activities support continued delivery of safe and reliable service; (2) activities are consistent with local, state, and federal regulations; (3) activities respond to operations, maintenance, and construction needs associated with projected growth and demands of city, county, and state agencies; (4) the forecast amounts are reasonable in light of historical spending and anticipated work increases, and (5) the activities support SDG&E's commitment to mitigate risks associated with hazards to public and employee safety, infrastructure integrity, and system reliability.

A. Other Services (1GD000)

The Other Services workgroup consists of miscellaneous expenses associated with Gas Distribution field operations not captured in other major workgroups. Table LPK-7 below summarizes Gas Distribution O&M costs associated with Other Services activities.

TABLE LPK-7
Other Services

GAS DISTRIBUTION (In 2021 $)			
A. Other Services	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Other Services	69	90	21
Total	**69**	**90**	**21**

1. Description of Costs and Activities

Other Services workgroup activities include leak investigations of customers' house lines, leak surveys of transmission mains, landscaping repair, and support of the installation of cathodic test stations for high-pressure main evaluation.

2. Forecast Method

In developing this forecast, historical expenditures for 2017 through 2021 were evaluated. Because of the wide range of activities recorded in this workgroup, as well as the cost fluctuations from year to year, a five-year average was selected to forecast future costs. The selection of the five-year average methodology results in an increase of $21,000 from the 2021 adjusted recorded base in TY 2024.

3. Cost Drivers

As indicated above, this group captures a wide array of activities. Therefore, the cost drivers are also diverse and have few, if any, common traits. Examples of cost drivers include:

- The number of leak investigation calls requiring customer houseline evaluation, which can be driven by unseasonable weather conditions or homeowner construction activity;
- Minor meter relocation and modification work and associated planning;
- Transmission main special leak surveys or patrols, which can be driven by regulatory requirement changes or Company policy changes; and
- General level of construction activity on services that requires landscaping repair, which is driven by changing economic or new business conditions.

B. Leak Survey (1GD001)

Recorded to this all RAMP workgroup are the labor and non-labor expenses associated with federal and state pipeline safety regulation,[14] which requires SDG&E to survey its gas distribution system for leakage. Table LPK-8 below summarizes Gas Distribution O&M costs associated with Leak Survey activities.

[14] 49 C.F.R. § 192.723 (Distribution systems: Leakage surveys); GO 112-F.

TABLE LPK-8
Leak Survey

GAS DISTRIBUTION (In 2021 $)			
B. Leak Survey	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Leak Survey	2,067	2,067	0
Total	**2,067**	**2,067**	**0**

1. Description of Costs and Activities

These pipelines are routinely surveyed for leaks at intervals of six month, one, and three-year intervals as determined by the pipe material involved (*i.e.*, plastic or steel), the operating pressure, whether the pipe is under cathodic protection, and the proximity of the pipe to various population densities. For example, a six-month survey cycle is typically used on high-pressure distribution mains and services. Annual surveys are scheduled in business districts, which are defined as a principal business area in a community where large numbers of people regularly congregate to engage in business activities, and near public service establishments, such as schools, churches, and hospitals. A one-year survey cycle is performed on Aldyl-A mains and services. Three-year survey cycles are typically used for state of the art (SOTA) plastic and cathodically protected steel mains and services installed in residential areas.[15]

In addition to routine leak surveys, the Company performs special leak surveys, as needed, and on more frequent cycles than those discussed above (*e.g.*, two or three months). Special leak surveys occur at various times, including ahead of street improvements to address pending leaks prior to street moratoriums; after the occurrence of any significant incident (*e.g.*, train derailment, explosion, earthquake, flooding, landslides, etc.) adjacent to high-pressure pipelines or related facilities; when increasing the maximum allowable operating pressure of a pipeline; when routine survey requirements are not considered adequate because of pipe condition or limited opportunity for gas to vent safely; or when there is a need to monitor pipe condition for special situations, such as material evaluations. Additional special leak surveys are also conducted on pipeline spans, pipelines through/on bridges, and areas of unstable earth.

[15] *See* 49 C.F.R. § 192.723(b)(1)(2).

During the survey, the field employee patrols above the identified location of SDG&E's distribution subsurface main and service pipelines with a leak detector to identify, classify, and generate an immediate repair work order, when necessary. SDG&E currently has 15,328 miles of main and service pipeline that require leak survey.

The leak survey cost supports the safety and reliability of SDG&E's system by performing the fundamental compliance and safety process of leak surveying pipelines to monitor for leakage in the pipeline system. Furthermore, this activity supports SDG&E's commitment to mitigate risks associated with hazards to public and employee safety, infrastructure integrity, and system reliability.

The Leak Survey workgroup mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-9 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD001).

TABLE LPK-9
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD001 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-9 - C07	Pipeline Monitoring (Leak Mitigation, Bridge & Span, Unstable Earth, and Pipeline Patrol	2,067	2,067	0	-

*Tranche level RSEs and additional details are available in SDG&E-04-WP.

2. Forecast Method

To reflect the most current conditions for leak survey, SDG&E's base year forecast for this workgroup is the 2021 adjusted recorded level of spending. This method is appropriate because labor and non-labor expenses increased collectively in 2021 due to recent changes in survey cycle activities, organizational changes, introduction of the Gas Emergency Department

to support leak responses, and the reposition of Leak Survey regionally based on the surveys they perform. Due to these recent changes in operation, a historical average would not represent future business needs. Therefore, 2021 was chosen as the base level of expense for future years. This forecast results in no change in expense over the 2021 adjusted recorded base in TY 2024.

3. Cost Drivers

The cost drivers supporting this forecast are the compliance requirement for the three-year atmospheric corrosion monitoring survey, and the six-month, one-year, and three-year frequency leak surveys, as well as special leak survey activities, and follow-up leak investigations. Follow-up leak investigation orders are issued to leak survey personnel by a service technician unable to locate the source of a possible customer reported leak. In order to close the leak investigation order, leak survey personnel must survey all underground gas facilities within 150 feet of initial location where the leak or odor was reported. Leak survey is a risk prevention activity and supports the RAMP[16] mitigation elements. Those elements include basic code mandated periodic leak surveys, inspections of bridges and spans and unstable earth, pipeline patrolling, as well as repairing leaks as a result of these inspections and patrols.

C. R-Locate & Mark (1GD002)

Locate and Mark is the process mandated by 49 C.F.R. § 192.614 and the California One Call Statute,[17] where the owner of underground facilities, when notified by the USA One-Call Center of a planned excavation, must respond within two working days and mark the location of those underground facilities that conflict with the planned excavations. Table LPK-10 below summarizes the Gas Distribution O&M costs associated with Locate and Mark activities.

TABLE LPK-10
R-Locate and Mark

GAS DISTRIBUTION (In 2021 $)			
C. R-Locate & Mark	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. R-Locate & Mark	7,116	10,096	2,980
Total	**7,116**	**10,096**	**2,980**

[16] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-9, Incident Related to the Medium Pressure System (Excluding Dig-in).

[17] Cal. Gov't Code § 4216, *et seq.*

1. Description of Costs and Activities

The activities completed under this cost workgroup are all RAMP, preventative in nature and are required to avert damages caused by third-party excavators working near gas and/or electric underground substructures. To comply with the Locate and Mark regulatory and legal requirements cited above, employees use an electronic pipe-locating device to identify the location of SDG&E's underground pipelines and utilize substructure maps and service history records to aid in verifying the location of the underground infrastructure.

Included in this workgroup is the Locate and Mark (L&M) Quality Assurance (QA) Program.[18] The L&M QA Program provides a variety of benefits to reduce the number of and potential for damage to gas infrastructure by a third party. By evaluating locate and mark activities that have been completed or are being performed, SDG&E can address gaps in performance with additional training, by updating company documentation, or by recording company assets. Locator errors can result in a mismark, or a ticket not completed within the required timeframe. Additionally, the QA review can highlight errors in the timely and/or accurate documentation of utility assets. Adherence to proper company policy and procedures reduces the percentage of locate and mark mismarks, increases the overall awareness of unsafe activity, and expedites response times.

Conducting stand-by observations of other entities excavating near SDG&E's pipelines is another important damage prevention activity included in this workgroup. Generally, this involves an employee inspecting construction job sites to confirm that excavators are aware of the location of critical SDG&E gas facilities. The State of California enacted regulations in 2007 that mandate a preconstruction meeting with excavators requesting Locate and Mark support and require continuous monitoring of all excavations within ten feet of high-pressure pipelines.[19]

In 2021, the California Governor signed SB 297 into law, which enacted the Wade Kilpatrick Gas Safety and Workforce Adequacy Act of 2021. The law makes any contractor causing damage to a subsurface installation subject to a civil penalty in an amount not to exceed $100,000 and possible suspension or revocation of the contractor's license if specified conditions

[18] Building a Better Business (BBB) is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest, and most reliable energy infrastructure company in America.

[19] *See* Cal. Code Regs., tit. 8, § 1541(b)(1)(B) (2007).

are met. Specified conditions include failing to provide notice of the need for a gas corporation to locate and mark its subsurface installations or commencing excavation before a gas corporation marks its subsurface installations. The State's added enforcement and SB 297's amendments increasing the maximum penalties are expected to compel more excavators to call USA, which will add upward pressure to an already increasing ticket volume in the State. Thus, the increased ticket volume will directly increase membership fees for Underground Service Alert of Southern California (DigAlert).

The impact on ticket volume resulting from SB 297, increased public awareness campaigns such as the Gold Shovel Program, and current regulations, will increase response demand from SDG&E as required by California Government Code Section 4216. The extent of increased expenses for Locate and Mark activities are difficult to accurately predict, thus SDG&E is requesting authorization for the Locate and Mark Balancing Account (LMBA), a two-way balancing account for this workpaper. Please refer to Regulatory Accounts testimony by Mr. Jason Kupfersmid for more details on the LMBA (Ex. SDG&E-43). The Locate and Mark workgroup mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety aligns with a RAMP activity.

Table LPK-11 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD002).

TABLE LPK-11
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD002 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-7 - C03	Locate & Mark Activities (MP)	6,538	9,436	2,898	368
SDG&E-Risk-7 - C04	Locate & Mark Activities (HP)	185	268	83	482
SDG&E-Risk-7 - C09	Locate & Mark Quality Assurance	393	393	0	2

*Tranche level RSEs and additional details are available in SDG&E-04-WP.

2. Forecast Method

In developing the TY 2024 forecast, historical expenditures and work units for 2017 through 2021 were evaluated. The cumulative expense trend of labor and non-labor increased from 2017 to 2021 fueled by a broadening recognition of improved safety outcomes afforded by locate and mark services. One indicator of service need is year-over-year ticket counts. Over the last 5 years, SDG&E has seen total USA tickets increase by 10.4%, see Table 12A below. Ticket counts for the first quarter of 2022 indicate a similar trend. Standby requirements and after-hour service window needs also indicate a pattern of growth that is expected to continue.

TABLE LPK-11A
Gas Distribution USA Ticket Volume by Year

YEAR	2017	2018	2019	2020	2021
USA Ticket Volume by Year – MP	135,460	133,304	148,350	163,174	151,106
USA Ticket Volume by Year – HP	7548	7702	8339	8,517	6,837

For these reasons, the Locate and Mark forecast is based on the linear trend observed from the last five years (2017 through 2021). Using a historical average or base year forecast would not appropriately account for the increase in work anticipated over the forecast period. Thus, to reflect these changing conditions and increase in Locate and Mark work, a five-year (2017 through 2021) linear trend was used to calculate the cumulative labor and non-labor request for this group. This forecast methodology results in an increase of $2,980,000 over the 2021 adjusted recorded base in TY 2024.

3. Cost Drivers

The cost drivers supporting this forecast are primarily driven by construction, infrastructure, and maintenance activities in the public and private sectors, public and private excavator awareness, increase of overhead electric to underground electric conversions, additional legislation (SB 297) which includes consequences for those who damage SDG&E underground infrastructure, and oftentimes changing landscape of legislation regarding excavation. Examples of these types of construction activities include private construction projects, such as commercial and industrial centers, strip malls, residential remodeling projects, and city projects such as street improvements and storm drain, water, and sewer pipeline

relocation work. These cost drivers support the safety and reliability of SDG&E's gas and electric underground system. Properly locating and marking gas and electric facilities, as well as performing stand-by observations, are activities completed to avert damage by third-party excavators that can interrupt gas service and pose a risk to public and employee safety.

D. Main Maintenance (1GD003)

Recorded to this workgroup are the labor and non-labor costs associated with investigating and repairing leaks in distribution mains and moving, lowering, and raising short sections of gas distribution mains, vaults, and related structures. The main maintenance work in this workgroup is designed to meet federal (49 C.F.R. §192) and state (GO 112-F) pipeline safety regulations and to extend the life of distribution main pipelines and related infrastructure. Table LPK-12 summarizes Gas Distribution O&M costs associated with Main Maintenance activities.

TABLE LPK-12
Main Maintenance

GAS DISTRIBUTION (In 2021 $)			
D. Main Maintenance	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Main Maintenance	5,009	5,822	813
Total	**5,009**	**5,822**	**813**

1. Description of Costs and Activities

As required by GO 112-F, SDG&E periodically surveys its entire pipeline system for leaks using specialized leak detection equipment. Information on all leaks identified must be recorded and classified and hazardous leaks repaired promptly. Also recorded to this workgroup is the Gas Distribution Emergency Department (GED). The costs in this work group are specific to gas emergencies on mains. These two core Main Maintenance activities, Leak Repair and Gas Emergency Department, are also identified in this work group as RAMP mitigations. Further details on these RAMP activities can be found below in the RAMP Activities Section.

In addition to leak repairs and GED, improvements by municipalities and other outside agencies can trigger the requirement to perform maintenance on gas mains and related equipment. This includes street widening, sewer and water line maintenance or replacement, and street resurfacing. In the case of street resurfacing, SDG&E's crews must locate buried gas facility vault lids that have been paved over, then uncover them or raise them so they are flush

with the new street surface. Municipality and local/state agency improvements are normally a function of availability of local funding, often a sign of stronger economic conditions. The cost associated with main maintenance supports SDG&E's commitment to providing sustainable, safe, and reliable natural gas to its customers.

a. RAMP Activities

There are two core activities in this work group which are RAMP mitigations. Leak Repair and Gas Emergency Department. These are two activities that SDG&E performs to drive sustainability, safety, and reliability.

Leak Repair – SDG&E's maintenance crews investigate leak indications and make repairs as needed. Completing leak repairs generally requires excavating in paved streets and landscaped areas to determine the exact location of the leak. This work often involves pavement cutting, trenching, and then repair of pipe facilities, followed by backfilling the excavation, compacting the soil, and making permanent repairs to pavement and landscaping as needed. Main leak evaluation and repair work is generally completed to mitigate risks associated with hazards to public safety, and to address infrastructure condition, and material degradation.

Gas Emergency Department – When SDG&E is notified of a gas emergency, it is critical to respond immediately and take measures to control escaping gas in the interest of public safety. To improve gas emergency response time, SDG&E established the GED. The GED is organized as two person crews dedicated to gas emergency response. The GED operates 24/7 in overlapping shifts to provide ample coverage during peak periods allowing for rapid response to calls of escaping gas. These dedicated "specialist" crews responding to gas emergencies reduce the risk of injuries and property damage to both the public and crew responding to the incident.

Table LPK-13 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD003).

TABLE LPK-13
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD003 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-9 - C06	Leak Repair – Main Portion	956	1,158	202	-
SDG&E-Risk-9 - C11	Gas Distribution Emergency Department – Main Portion	1,230	1,734	504	-

*Tranche level RSEs and additional details are available in SDG&E-04-WP.

2. Forecast Method

A variety of factors influence the level of spending on main maintenance in any given year. These factors include: increasing government regulations, maintaining an aging infrastructure, ensuring public safety, meeting municipality requirements, and unplanned material failure. Activities which illuminate additional maintenance required, such as increased leak survey cycle frequency resulting in increased miles of pipe surveyed per year and the introduction of an Aerial Methane Mapping (AMM) pilot[20] as part of the 2022 SB1371 Compliance Plan also impacts spending levels. The labor and non-labor Main Maintenance costs have experienced an upward trend in costs associated with multiple work drivers, as discussed in the Cost Drivers section below. SDG&E anticipates this trend will continue.

Regulatory/legislative pressures continue to increase, the infrastructure is getting older, and municipality work and general construction costs continue to increase. Therefore, a five-year (2017 through 2021) linear trend was used to forecast base expense for this workgroup. Using a simple average forecasting method would not be appropriate for this work category, as it would not sufficiently fund critical compliance and maintenance work for the anticipated growing work requirements.

[20] *See* SDG&E's 2022 SB 1371 Compliance Plan.

This five-year linear forecast results in an increase of $813,000 over the 2021 adjusted recorded base in TY 2024.

3. Cost Drivers

The work completed in this workgroup is driven by federal and state pipeline safety regulatory requirements and SDG&E's efforts to protect the integrity of the pipeline system through activities that extend its life. These activities support SDG&E's commitment to mitigate risks associated with hazards to public safety, infrastructure integrity, and system reliability. As outlined above, a variety of factors influence the level of spending on main maintenance in any given year. These factors include:

- The number of leaks evaluated and repaired each year – This work is generally completed to address public safety, infrastructure condition, and material degradation. As previously discussed, leaks are found by employees conducting leak surveys and other field activities, or by customers who call reporting a gas odor.
- The level of repairs associated with damages to pipeline facilities by third parties – This cost is driven by the number and severity of the damage. For example, damage to a service line is less costly than damage to a high-pressure line which may require multiple days of work and many personnel to address. Damages are driven by the level of construction in the private and public sector, which is typically driven by economic conditions.
- The level of work completed by municipalities – Typical municipality projects include street resurfacing, widening or reconstruction, and sewer and water pipeline maintenance, replacement, or new installations. Per applicable franchise agreements, SDG&E is required to complete associate maintenance, such as raising or lowering valve casings and lids; altering the elevation of pipeline segments in their present locations; or relocating pipeline segments or related facilities completely. The impact to SDG&E can vary significantly, depending on the availability of municipality funds, which are typically driven by economic conditions. As economic conditions continue to improve, construction by municipal agencies is likely to increase.

E. Service Maintenance (1GD004)

Recorded to this workgroup are the labor and non-labor costs associated with service alterations, investigating, and repairing leaks in distribution services. The service maintenance work in this workgroup is designed to meet federal (49 C.F.R. §192) and state (GO 112-F) pipeline safety regulations and to extend the life of distribution main pipelines and related infrastructure. Table LPK-14 summarizes Gas Distribution O&M costs associated with Service Maintenance activities.

TABLE LPK-14
Service Maintenance

GAS DISTRIBUTION (In 2021 $)			
E. Service Maintenance	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Service Maintenance	3,293	4,116	823
Total	**3,293**	**4,116**	**823**

1. Description of Costs and Activities

Service Maintenance work is generally corrective in nature and is required to provide resilient, safe, and reliable natural gas service. Recorded to this workgroup are the labor and non-labor costs associated with service alterations, investigating, and repairing leaks in distribution services. The work in this workgroup is designed to meet federal (49 C.F.R. §192) and state (GO 112-F) pipeline safety regulations, extend the life of the distribution service pipeline system, and mitigate risks associated with hazards to public safety.

Also recorded to this workgroup is the GED. The costs in this work group are specific to gas emergencies on services. These two core Service Maintenance activities, Leak Repair and Gas Emergency Department, are also identified in this work group as RAMP mitigations. Further details on these RAMP activities can be found below in the RAMP Activities Section.

In addition, expenses associated with the repair of service risers—the portion of the pipeline segment located above ground just below the meter and connected to the service pipe—are recorded to this service maintenance workgroup. Repairs to the riser are often required due to atmospheric corrosion of the piping system.

Service Maintenance includes costs for moving, lowering, and raising shorter sections of distribution services, vaults, and related structures. Changing the location of an existing service may be required due to alterations in buildings or grounds, and municipal improvements, such as street widening or sewer or water system work. These activities typically involve excavation in paved or landscaped areas, for which there must be a corresponding restoration effort as part of completing the work. The cost associated with Service Maintenance supports SDG&E's commitment to mitigate risks associated with hazards to public safety, infrastructure integrity and system reliability.

a. RAMP Activities

There are two core activities in this work group which are RAMP mitigations. Leak Repair and Gas Emergency Department are two activities that SDG&E performs to drive sustainability, safety, and reliability. Detailed descriptions of these RAMP activities are described below:

Leak Repairs - One RAMP control that helps mitigate the risk on service lines is the investigation of leak indications and making repairs as needed. This RAMP activity was identified in the 2021 RAMP Report: Incident Related to Medium Pressure System: Leak Repair.[21] This includes excavating to determine the exact source of a leak, changing service valves, checking the condition of coating at the MSA, testing service pipe for leaks, inspecting and testing service pipe after repairs have been made, and installing, maintaining, and removing temporary feeds such as "by-passes" or temporary supply sources. In addition, included in RAMP are expenses associated with the repair of service risers—the portion of the pipeline segment located above ground just below the meter and connected to the service pipe. Repairs to the riser are often required due to atmospheric corrosion of the piping system.

Gas Emergency Department - Another RAMP activity identified in this work group is Chapter 9, Incident Related to Medium Pressure System: Gas Distribution Emergency Department (GED).[22] In this work group, the costs are specific to gas emergencies on services, but the activities and structure of the GED is the same as explained in Section IV. D (Main Maintenance) above.

Table LPK-15 below provides the RAMP activities and their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD004).

[21] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-9, Incident Related to the Medium Pressure System (Excluding Dig-in).

[22] *Id.*

TABLE LPK-15
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD004 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-9 - C06	Leak Repair – Service Portion	1,561	1,622	61	-
SDG&E-Risk-9 - C11	Gas Distribution Emergency Department – Service Portion	820	1,155	335	-

*Tranche level RSEs and additional details are available in SDG&E-04-WP.

2. Forecast Method

In developing the TY 2024 forecast, historical expenditures and work units for 2017 through 2021 were evaluated. A variety of factors influence the level of spending on Service Maintenance in any given year. These factors include increasing government regulations, aging infrastructure, public safety, municipality requirements, material failure, infrastructure, economic conditions, and through increased leak survey cycle frequency resulting in increased miles of pipe surveyed per year and the introduction of an Aerial Methane Mapping (AMM) pilot[23] as part of the 2022 SB1371 Compliance Plan. The labor and non-labor Service Maintenance costs have experienced an upward trend in costs associated with multiple work drivers, as discussed in the Cost Drivers section below. SDG&E anticipates this trend continuing.

Regulatory/legislative pressures continue to increase, the infrastructure is getting older, and municipality work and general construction continues to increase. Therefore, a five-year (2017 through 2021) historical linear trend was used to forecast base expense for this workgroup. Using a simple average forecasting method would not be appropriate for this work category, as it

[23] *See* SDG&E's 2022 SB1371 Compliance Plan, *available at:* https://www.sdge.com/sites/default/files/regulatory/2022%20SDGE%20SB%201371%20Compliance%20Plan.pdf.

would not sufficiently fund critical compliance and maintenance work for the anticipated growing work requirements.

This five-year linear forecast results in an increase of $823,000 over the 2021 adjusted recorded base in TY 2024.

3. Cost Drivers

The work completed in this workgroup is driven by the requirement to meet federal and state pipeline safety regulations and to protect the integrity of the pipeline system through activities that extend its life. These activities support SDG&E's commitment to mitigate risks associated with hazards to public safety, infrastructure integrity, and system reliability. As outlined above, multiple factors influence the level of spending on service maintenance in a given year. These factors include:

- The number of leaks evaluated and repaired each year - This work is generally completed to address public safety, infrastructure condition, and material failure. As discussed previously, leaks are found by employees conducting leak survey, and other field activities or by customers who call reporting a gas odor.
- The level of repairs associated with damages to pipeline facilities by third parties, outside sources, or causes such as fire or flooding - This cost is driven by the number and severity of the damage. Damages are typically driven by the level of construction in the private and public sector, which is typically driven by economic conditions.
- Requirements to alter gas service lines and MSAs to correct unsafe conditions or changes in customer load usage - This also includes work to change, raise, or lower service valves; and repair or replace curb valves or meter boxes.
- The level of work completed by municipalities - Typical municipality projects include street resurfacing, widening or reconstruction; and sewer and water pipeline maintenance, replacement or new installations. Per applicable franchise agreements, SDG&E is required to complete associated maintenance, such as: raising or lowering valve casings and lids; altering the elevation of pipeline segments in their present locations; or relocating pipeline segments or related facilities completely. The impact to SDG&E can vary significantly, depending on the availability of municipality funds, which are typically driven by economic conditions. As economic conditions continue to improve, construction by municipal agencies is likely to increase.

F. Tools, Fitting, and Materials (1GD005)

Recorded to this workgroup is the purchase of small tools, small pipe fittings, miscellaneous pipeline materials, and miscellaneous installation materials used during construction and maintenance activities and those held in inventory as vehicle truck stock. Table

LPK-16 summarizes Gas Distribution O&M costs associated with Tools, Fittings and Materials activities.

TABLE LPK-16
Tools, Fitting, and Materials

GAS DISTRIBUTION (In 2021 $)			
F. Tools	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Tools	1,708	1,667	-41
Total	**1,708**	**1,667**	**-41**

1. Description of Costs and Activities

The tools, fittings and materials purchased under this workgroup are necessary to obtain complete and safe work results. Included within each category of materials are items, such as:

- Small tools, including screw drivers and wrenches;
- Pipe materials used in maintenance and construction activities, such as service alterations, service leak repairs, riser repairs and replacements, and maintenance of meter and regulator facilities on distribution services;
- Miscellaneous installation and pipeline materials, such as pipe wrap, gaskets, washers, bolts, stakes, and pipe straps used by field employees to complete pipeline maintenance and replacement activities; and
- Pipe fittings, two-inch pipe size and smaller, commonly used during construction and maintenance work; and coveralls, uniforms, and charges for rental and laundering of these garments.

a. RAMP Activities

One RAMP control that is called out in the 2021 RAMP Report is identified in this work group is Chapter 8: Incident Involving an Employee: Personal Protective Equipment (PPE) – C10[24] which applies to Gas Distribution's flame-resistant PPE (clothing) program. This PPE is to protect employees from the risk of injury by creating a barrier against flammable workplace hazards. All employees who are required to use PPE are trained on when PPE is necessary, which PPE is necessary, how to properly don/remove/adjust/wear PPE, limitations of PPE, and the proper care/maintenance/life/disposal of PPE.

[24] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-8: Incident Involving an Employee.

Table LPK-17 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD005).

TABLE LPK-17
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD005 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-8 - C10	Personal Protective Equipment	441	441	0	0

* An RSE was not calculated for this activity.

2. Forecast Method

The forecast method developed for this cost category is a three-year average for the period 2019 through 2021. Years 2017 and 2018 were not included in the average as they are considerably lower than recent years which did not include the Gas Emergency Department, the 100% conversion of Locate and Mark to internal resources, and changes in Cal-OSHA FR calorie requirements for clothing. This method is most appropriate because this is a grouping of expenses that can fluctuate from year to year, depending on the level of construction and maintenance activities.

Included in the forecast are incremental work elements necessary to support the work of Field Utility Specialists. These elements are described below:

- Thirty-Five handheld range finders - Thirty-Five handheld range finders are required for Field Utility Specialist personnel to be used to determine electric wire heights for electric conflict checks and above proposed gas construction activity to determine safe locations for gas handling requirements. See Section V.V Local Engineering Pool (902) for additional information. There are no added expense over the base forecast for this upward pressure for TY 2024.
- Thirty-Five field capable tablets - Thirty-Five field capable tablets are requested for Field Utility Specialist personnel to be used to help with efficiency and

accuracy with design of gas infrastructure while in the field.[25] There is no added expense over the base forecast for this upward pressure for TY 2024.

The total funding required represents a change from the 2021 adjusted-recorded base, including the incremental additions in this workgroup, of ($41,000) in TY 2024.

3. Cost Drivers

The rate of consumption of the materials covered in this workgroup is primarily driven by construction and maintenance activity, which in turn, is often a reflection of economic conditions. Other drivers include the level of field workforce that requires tools and materials, as well as the cost at which SDG&E can obtain tools, fittings, improvements in technology and materials used by its employees. As these cost pressures increase, they impact the overall cost for this activity.

G. Electric Support (1GD006)

Recorded to this workgroup is the labor and non-labor expense incurred by Gas Distribution crews and supervisory management to provide support for Electric Distribution crews during inspections under the Corrective Maintenance Program and general construction activities. Table LPK-18 summarizes Gas Distribution O&M costs associated with Electric Support activities.

TABLE LPK-18
Electric Support

GAS DISTRIBUTION (In 2021 $)			
G. Electric Support	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Electric Support	514	495	-19
Total	**514**	**495**	**-19**

1. Description of Costs and Activities

GO 165 mandates specific inspection cycles for electric distribution facilities. Other inspections are covered by GO 95 (Overhead Electric Line Construction) and GO 128

[25] BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest, and most reliable energy infrastructure company in America.

(Underground Electric Supply Construction), which direct utilities to frequently and thoroughly inspect electric distribution equipment. These inspections are part of SDG&E's Electric Distribution Corrective Maintenance Program (CMP) and require some trenching and excavation support from the Gas Distribution workforce. The CMP is further described by Mr. Swetek (Ex. SDG&E-12). In addition, Gas Distribution field crews provide electric tooling and excavation support to the Electric Distribution organization.

2. Forecast Method

In preparing the forecast for this workgroup, SDG&E reviewed 2017 through 2021 historical spending levels for gas crews and supervisory support in assisting Electric Distribution maintenance and storm damage recovery activities. The forecast method developed for this cost category is a three-year average for the period 2019 through 2021. This method is appropriate because the level of activity in this workgroup can fluctuate from year to year, depending on the level of the Electric Distribution Corrective Maintenance Program work and general construction activities. Years 2019-2021 were considered appropriate to include in an average because these years most accurately represent the level of support Gas Distribution provides Electric Distribution.

The total funding required represents a change from the 2021 adjusted recorded base of ($19,000) in TY 2024.

3. Cost Drivers

The cost drivers behind this forecast are electric Corrective Maintenance Program activities utilizing Gas Distribution resources for support activities including small modifications or repairs to Electric Distribution facilities.

H. Measurement & Regulation (1GD007)

Recorded to the Measurement & Regulation (M&R) workgroup are labor and non-labor expenses for inspection and maintenance of distribution regulator stations, gas system valves, large meter set assemblies (MSA), electronic instrumentation, company Compressed Natural Gas (CNG) station, and meter removals for accuracy checks to maintain compliance with GO 58-A. Table LPK-19 summarizes Gas Distribution O&M costs associated with M&R activities.

TABLE LPK-19
Measurement & Regulation

GAS DISTRIBUTION (In 2021 $)			
H. Measurement & Regulation	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Measurement & Regulation	4,638	5,153	515
Total	**4,638**	**5,153**	**515**

1. Description of Costs and Activities

Included in this work group is SDG&E's request for the inspection and maintenance of regulator stations, critical valves, and large meter sets.[26] Regulator stations reduce the pressure of gas entering the distribution system from high-pressure supply pipelines to the lower pressures used in the distribution pipeline network. This core Measurement & Regulation activity; Regulator Station, Valve, and Large Meter Set Inspections; is also identified in this work group as a RAMP mitigation. Additionally considered as a RAMP mitigation in this workgroup is the support of the Control Center Modernization (CCM) Distribution Field Asset Real Time Monitoring and Control Site Installations/Upgrades & New Control Room Technologies. Further details on these RAMP activities can be found below in the RAMP Activities Section.

Some additional activities in the M&R work group are more service based, which are inspection and calibration of gas volume correctors used to record gas consumption, and ten-year rotary meter changes or calibrations to comply with GO 58-A for large customers.

Overall, the activities covered in this workgroup support SDG&E's commitment to mitigate risks while providing resilient, safety and reliable service.

a. RAMP Activities

There are two activities in this work group which are RAMP mitigations – Regulator Station, Valve, and Large Meter Set Inspections and support of the Control Center Modernization (CCM) Project. These are two activities that SDG&E performs to drive sustainability, safety, and reliability. These RAMP activities are described below:

[26] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-9, Incident Related to the Medium Pressure System (Excluding Dig-in) - C04.

Regulator Station, Valve, and Large Meter Set Inspections[27] – SDG&E has approximately 490 regulator stations. Federal pipeline safety regulation 49 C.F.R. §192.739(a) requires annual inspections and maintenance of all regulator stations, including both underground vaults and above-ground regulator station enclosures. Pressure checks are made to verify that the station is operating as intended and that the station's over- and under- pressure protection devices perform as designed. If a station does not perform properly, internal maintenance and inspections are performed, consisting of disassembling the regulator devices and inspecting the internal components for worn or damaged parts. Any faulty parts are replaced and the regulator is cleaned and inspected for corrosion. Activities for repairing damage to regulator station vaults caused by general deterioration or long-term exposure to heavy traffic, and rebuilding pressure regulators and pressure relief valves, are additionally charged within this workgroup.

Regulator stations are critical control elements in the gas distribution system. Failure of a regulator station could result in under- or over-pressurization of the gas distribution system, resulting in reduced service to customers and/or jeopardizing public safety. Therefore, proactive maintenance of these facilities is a priority. In addition, regulator stations are part of our aging infrastructure. Presently 71% of our operating regulator stations are 24 years or older. The average age of a distribution regulator station is 32 years. This aging will translate into increased maintenance expense over future years.

Furthermore, valves maintained within this workgroup have several important purposes including: fire valves at regulator stations to isolate the high- and medium-pressure systems; emergency valves to isolate segments of pipelines in case of pipe damage or for operational purposes; and isolation valves to segment portions of the system in the event of a widespread emergency, such as an earthquake. Expenses for the inspection and calibration of electronic pressure monitors used to measure and record distribution system pressures are also included.

Support of the Control Center Modernization (CCM) Project – The second major RAMP activity included in this workgroup outside of the traditional M&R activities is the support of the CCM Distribution Field Asset Real Time Monitoring and Control Site Installations/Upgrades &

[27] *Id.*

New Control Room Technologies Project.[28] Support of the CCM project is an incremental add, which includes the addition of gas distribution field employees to support the deployment of electronic pressure monitors (EPM), inspection and calibration of EPMs used to measure and record distribution system pressures. Further description of the CCM project will be included in the Gas Transmission Operations and Construction testimony of Messrs. Chiapa, Hruby, and Bell. (Ex. SCG-06).

Table LPK-20 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD007).

TABLE LPK-20
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD007 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-9 - C04	Regulator Station, Valve, and Large Meter Set Inspection	4,028	3,987	-41	-
SDG&E-Risk-9 - C17	Control Center Modernization - Incremental add of personnel	0	480	480	-

*Tranche level RSEs and additional details are available in SDG&E-04-WP.

2. Forecast Method

In developing the TY 2024 forecast, SDG&E evaluated the historical expenditures for 2017 through 2021 for the M&R workgroup. Labor and non-labor expenses stayed fairly at a flat level of expense from 2017 to 2021 due to the wide range of activities included in this group and without major regulatory or compliance drivers over this timeframe. Therefore, a five-year

[28] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-9, Incident Related to the Medium Pressure System (Excluding Dig-in) - C17.

historical average best represents the level of funding needed to support inspection and maintenance activities for this workgroup.

Added to this base is an incremental work element necessary to support the CCM Project as described below.

CCM Support – This incremental funding provides operational support to the RAMP CCM project, operation, and maintenance of communication equipment necessary to monitor the distribution gas system. Added will be one CCM Supervisor, starting in 2022 and continuing thereafter. In addition, four Regulator technicians will be added starting in 2023 and continuing thereafter. An additional vehicle requirement will be added to support these additional positions. This incremental vehicle requirement is included in the Fleet Services Testimony of Mr. Alvarez, (Ex. SDG&E-22). The incremental funding needed over the base forecast for this upward pressure is $480,000 for TY 2024.

The total funding required over the 2021 adjusted recorded base including the incremental addition in this workgroup is $515,000 in TY 2024.

3. Cost Drivers

Work activities within the M&R workgroup are driven by regulatory requirements, as well as the need to mitigate risks associated with hazards to public and employee safety and system resilience and reliability. Cost drivers associated with this workgroup include:

- The number of inspections and follow-up maintenance that must be completed at each of the facilities maintained by the M&R team. These facilities include regulation stations, valves, MSAs, pressure/volumetric correctors, and electronic pressure monitors.
- The volume of recurring routine, scheduled maintenance work, and unscheduled maintenance work. Unplanned work includes, for example, work driven as a result of the malfunction of a device.
- Emergency support requirements. This includes the activities for responding to a shutdown caused by pipeline damage, a pressure incident, or major event as in the case of an earthquake, and support of general operations requirements, for example, test shutdowns to determine system behavior under specific conditions.
- The age and type of equipment installed. Generally, older or obsolete equipment requires more frequent and more extensive maintenance work.
- Other cost drivers. These include customer requests associated with measurement issues at MSAs and regulatory requirements for additional or stricter standards.

I. Cathodic Protection (1GD008)

Expenses for activities recorded for this all RAMP workgroup are for the inspection, evaluation, and monitoring of the Cathodic Protection (CP) system on SDG&E's steel distribution pipelines to maintain and operate the system in accordance with state and federal regulations. Table LPK-21 summarizes Gas Distribution O&M costs associated with Cathodic Protection activities.

TABLE LPK-21
Cathodic Protection

GAS DISTRIBUTION (In 2021 $)			
I. Cathodic Protection	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Cathodic Protection	2,050	1,834	-216
Total	**2,050**	**1,834**	**-216**

1. Description of Costs and Activities

Buried steel pipelines will corrode and revert back to their natural state as an iron oxide without proper intervention. Corrosion on pipelines increases the potential for leaks and may reduce the pipeline's useful life. In addition to the application of coating and electrical isolation, cathodic protection is one method for mitigating external corrosion on steel pipelines. CP combats corrosion by imposing an electric current flow toward the surface of the pipeline, which keeps the pipeline negatively charged (cathodic) with respect to the surrounding soil. CP systems are at risk of interference from construction or operations of nearby utilities, such as water lines, telephone, or cable television ground systems, and electric railway power systems, all of which can reduce the performance of the CP system. The CP system requires continual monitoring for interference, measurement of its performance, and maintenance of its associated equipment to maintain adequate levels of protection. It is for this reason that this entire work group was identified as a RAMP activity in the 2021 RAMP report, Chapter 9: Incident Related to Medium Pressure System: Cathodic Protection Program – O&M – C01[29]

[29] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-9, Incident Related to the Medium Pressure System (Excluding Dig-in) - C01.

These efforts are undertaken to maintain the longevity and performance of SDG&E's distribution steel pipeline system and are performed by system protection specialists responsible for maintaining compliance with appropriate regulations. Inspection, evaluation, and monitoring of the pipelines' CP system can include: checking rectifiers for proper operation, identifying the location of interface bonds, evaluating "short circuits," identifying locations for installation of anodes for continued pipe protection, and taking pipe-to-soil reads to evaluate electric current levels. Based on the results of these monitoring activities, replacement, upgrade, or alteration of the CP system components may be planned. Diminished CP effectiveness could lead to increased corrosion, a more rapid deterioration of the steel pipeline and subsequently increased leakage, thus leading to potential risks associated with public safety, risk of methane gas release, and infrastructure integrity.

The Cathodic Protection workgroup mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-22 below provides the RAMP activities, their respective cost forecasts, and the RSEs for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD008).

TABLE LPK-22
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD008 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE**
SDG&E-Risk-9 - C01	Cathodic Protection - O&M	2,049	1,834	-215	-

*Tranche level RSEs and additional details are available in SDG&E-04-WP.

2. Forecast Method

SDG&E's forecast for this compliance workgroup is a five-year historical average. Labor and non-labor expenses have collectively remained level over the historical years 2017-2021. Although the Company has seen a slight increase in maintenance work to meet code

compliance requirements as the system ages and gaps in the cathodic protection system are assessed through the Company's Geographic Information System (GIS). However, this increase will be offset by the installation of Realtime Monitoring Units (RMU's) (SDG&E-9-M02). The RMU installation effort will help to streamline the monitoring and data capture of CP rectifier compliance activities without the need for addition labor support.[30] A five-year historical average would best represent anticipated work level and future resource needs.

The total funding required represents a change from the 2021 adjusted recorded base of ($215,000) in TY 2024.

3. Cost Drivers

The basic cost drivers for this workgroup include the number of inspections and associated evaluations (troubleshooting) that must be completed, to meet compliance requirements each year, for each CP area and isolated CP segment. Based on the results of these monitoring activities, follow-up maintenance action is often necessary. These maintenance activities may include replacing, upgrading, or altering components of the CP system, such as anodes, rectifiers, beds, bonds, test points, electric drops, anode wells, and insulators. Many of these activities are driven by the age of the system components, with older elements generally requiring more maintenance.

Furthermore, the typical life of anodes, a critical component of the CP system, can vary depending on a number of drivers including the weather, soil conditions, the pipeline length it is protecting, and the effectiveness of the pipe's coating. Anode depletion is accelerated by drought conditions, as dry soil does not allow the current to travel as far and protect as much pipe. In addition, some soils are more resistive than others, causing anodes to deplete at a higher rate.

CP maintenance work is often reactive to activities of municipalities, other utilities, and construction firms as they complete projects of street reconstruction, widening, or resurfacing; or sewer and water line maintenance and replacement as these activities can lead to CP component damage. In addition, pipes can come into contact with water lines or with third-party grounding systems that can drain current from the pipeline, thus reducing the level of protection and

[30] BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest, and most reliable energy infrastructure company in America.

depleting anodes. Customers placing metal objects against an MSA riser can have the same effect as shorting out the CP current.

J. Asset Management (1GD009)

Asset Management includes activities and associated O&M expenses incurred in the evaluation of the condition of the distribution system. This includes maintaining asset records, identifying corrective maintenance solutions, and coordinating with field personnel on completion and recording of O&M activities. Table LPK-23 summarizes Gas Distribution O&M costs associated with Asset Management activities.

TABLE LPK-23
Asset Management

GAS DISTRIBUTION (In 2021 $)			
J. Asset Management	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Asset Management	1,078	1,375	297
Total	**1,078**	**1,375**	**297**

1. Description of Costs and Activities

Recorded to this workgroup are labor and non-labor expenses for pipeline maintenance technical planning office personnel, regional engineering, pipeline mapping personnel, various analytical and administrative support positions, quality assurance, and associated supervision. SDG&E's Asset Management groups provides many of the technical and administrative services needed for the successful and timely completion of the O&M activities discussed in Section IV.A-I above. Activities performed by this planning office include items such as:

- Identify construction design requirements;
- Evaluate pressure specifications;
- Coordinate pipeline planning;
- Provide project drawings;
- Identify material selection;
- Prepare work order estimates;
- Acquire third party contract services (e.g. paving, traffic control plans, and operated equipment);

- Obtain permits for construction from city, county, state, and federal agencies; and
- Verify that services provided by third parties meet Company standards.

The organizations in this work group also support the regions' emergency response efforts by managing the Gas Emergency Center (GEC). The GEC is activated during a significant event (*e.g.*, fire, earthquake, pipeline damage, customer outage) to support field operations with engineering, pipeline planning, mapping, logistics, and office resources that are vital in returning SDG&E's facilities back to normal operations.

This workgroup additionally includes expenses to map the pipeline facilities. As gas system construction projects are completed throughout SDG&E's service territory, accurate pipeline data must be captured and records kept for the life of the pipeline, consistent with GO 112-F and 58-A. Projects requiring mapping and database records work include all new business activity, pipeline relocations, main extensions, pressure betterment projects, pipeline replacements, and various other operational activities that change the gas system configuration. GIS based mapping system adds the capability to capture pipeline attribute data, and this data is added to the facilities when mapped in GIS. GIS mapping personnel are responsible for updating all distribution infrastructure maps whenever facilities in the field are constructed, modified, or replaced. The timely maintenance of these Gas Distribution system records is a critical risk mitigation measure in preventing hazards to public and employee safety, infrastructure integrity, and to the reliable delivery of natural gas to SDG&E's customers.

Included in this workgroup is an incremental add for the cross functional support of asset management and the enterprise Asset Integrity Management team. The incremental add for these workgroups are included in the forecast methodology section below.

a. RAMP Activities

The RAMP activities in this work group are two-fold: (1) complete and accurate maps of the gas infrastructure data, and (2) the incremental addition of the Gas Asset Management Advisor. The entirety of the accurate and complete GIS records of the Gas Distribution system is a critical risk mitigation measure in preventing hazards to public and employee safety, infrastructure sustainability, and also supports the reliable delivery of natural gas to SDG&E's customers. The Gas Asset Management Advisor is to provide support to sustainably manage gas assets and asset systems and their associated performance, risks, and expenditures over their life cycles.

Table LPK-24 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD009).

TABLE LPK-24
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD009 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-CFF-1 - 1	AIM (Gov, Strat, AIP)	0	110	110	-
SDG&E-CFF-6 - New 02	Gas Geographic Information System	591	591	0	-
SDG&E-CFF-6 - New 03	Gas Geographic Information System	0	58	58	-

*Tranche level RSEs were not calculated for these CFFs. Additional details are available in SDG&E-04-WP.

2. Forecast Method

Planning, engineering, and facility mapping activities, their expenses, vary as the level of maintenance work, general construction activity, municipality work, customer generated activity, and expense allocations change. Due to recent cost drivers for these activities, a historical average would not represent future business needs. Therefore, 2021 was chosen as the base level of expense for future years. Added to this base are incremental work elements necessary to support the growth in activity in the GGIS workgroup, the workgroup responsible for SDG&E's GGIS system, and Compliance/QA/Engineering workgroup. These elements are described below. The total funding required over the 2021 adjusted recorded base including the incremental additions in this workgroup is $297,000 in TY 2024.

a. GGIS Growth

Consistent with RAMP CFF-6 Records Management Incremental add,[31] one GIS Technician will be added in the GGIS workgroup beginning in 2022 and another in 2023. These positions will charge 23% of their time to O&M. These positions support an increase in projects requiring mapping and records work driven by new business activity, pipeline relocations, main extensions, pressure betterment projects, pipeline replacements, main and service maintenance, GO 112-F reporting requirements, and various other operational activities that impact the gas system configuration. GIS is the system of record for Gas Distribution facilities, containing a graphical representation of the facility location and facility attributes.

The continued compliance with GO 112-F requires that:

> At the same time [annually] that copies of reports required by Section 123.1 are submitted, the following information shall be submitted to demonstrate to the Commission and the public and Operator's efforts towards minimizing the risk from system leaks and failures: … the amount of time it takes for changes, repairs, or new facilities to be finalized and updated, per the Operator's procedures, to the Operator's facilities maps segregated into less than 14 days, 14 to 30 days, 30 to 90 days, 90 to 180 days, 180 to 360 days, and more than 360 days.[32]

The addition of GIS Technicians will allow SDG&E to meet the Company's goal of capturing attributes and mapping the facilities or changes within 180 days. The GIS Technicians capture and catalogue up to 30 attributes into a GIS database for each mapped facility. Examples of recorded attributes include pipe diameter, material, installation year, installation work order, maximum allowable operating pressure, leak survey cycles, pressure district number, and cathodic protection system attributes. The total incremental funding needed for this workgroup element is $58,000 over the base forecast for TY 2024.

b. Additional Cathodic Protection QA Technical Specialist

One Cathodic Protection QA Technical Specialist will be added starting in 2022 to review the work done by the company System Protection personnel in the field, determining the effectiveness and adequacy of the processes and procedures used in normal operation and

[31] *See* SDG&E's 2021 RAMP Report, SDG&E-CFF-6, Records Management.

[32] GO 112-F, Section 123.1.

maintenance, verification of training effectiveness, provide insight into accuracy of work performed in accordance with Company standards, proactively address trends, and share findings with impacted stakeholders to facilitate continuous improvement. This position will charge 33% of their time to O&M. An incremental vehicle ask will be included in Fleet Services Testimony of Mr. Alvarez (Ex. SDG&E-22) for this incremental add. The total incremental funding needed for this workgroup element is $33,000 over the base forecast for TY 2024.

c. Additional Field Operations QA Inspector

One Field Ops QA Inspector will be added starting in 2022 to review the work done by the company Gas Field Operations personnel in the field, determining the effectiveness and adequacy of the processes and procedures used in normal operation and maintenance, verification of training effectiveness, provide insight into accuracy of work performed in accordance to Company standards, proactively address trends and share findings with impacted stakeholders to facilitate continuous improvement. This position will charge 50% of their time to O&M. An additional vehicle requirement will be added to support this additional position. This incremental vehicle requirement is included in the Fleet Services Testimony of Mr. Alvarez, (Ex. SDG&E-22). The total incremental funding needed for this workgroup element is $50,000 over the base forecast for TY 2024.

d. Additional Engineers

Engineer for Hydrogen Projects – One Engineer will be added starting in 2022 to focus on hydrogen blending in natural gas pipeline systems. This position will charge 10% of their time to O&M. In addition, two Engineer I/II will be added beginning in TY 2024 for implementing 3D M&R facility design and support Gas Operations Control Center monitoring, and control retrofit projects at regulator station and pressure monitoring sites. These positions will charge 10% of their time to O&M. The total incremental funding needed for this workgroup element is $46,000 over the base forecast for TY 2024.

e. Asset Integrity Management

Consistent with RAMP Cross Functional Factors: Asset Management Incremental,[33] one Gas Asset Strategy Advisor will be added in 2022 to encompass Gas Distribution into the

[33] A.21-05-011 SDG&E-CFF-1 Asset Management.

enterprise-wide Asset Integrity Management (AIM) Program.

The Asset Integrity Management (AIM) program advances the development and implementation of a comprehensive, sustainable and risk informed Asset Management System (AMS), which encompasses people, process, data, analytics, and technology. The AIM program's Integrated Operating Model and Asset Management Plan alignment establish systematic and coordinated activities and practices through which the Company optimally and sustains and asset systems and their associated performance, risks, and expenditures over their life cycles to effectively allocate resources. For further details, please refer to Mr. Deremer's (Ex. SDG&E-31) testimony.

This position will charge 100% of their time to O&M. The total incremental funding needed for this workgroup element is $110,000 over the base forecast for TY 2024.

3. Cost Drivers

As discussed above, Asset Management work is driven by the level of operations and maintenance activity in other workgroups covered in this testimony. Field O&M planning is experiencing an increase in general construction and customer-generated activity, which requires additional planning time. In addition, work in the public right-of-way requires the technical services offices to perform more planning work required for pipeline relocations.

Additional planning section labor is required to respond to regulatory agencies, including the National Transportation Safety Board (NTSB), Pipeline and Hazardous Materials Safety Administration (PHMSA), and the Commission. These agencies continue to require pipeline operators to provide and retain documentation for all aspects of gas pipeline design, construction, pressure test records, project close out, inspection and mapping. This directs operators of gas pipelines to verify that the records are traceable, verifiable, and complete. As the volume of documentations increases, so does the need for personnel to manage, generate, validate, and verify that adequate documentation is accessible and retained.

K. Operations Management, Supervision, and Training (1GD010)]

Described in this section of testimony are activities representing leadership and operations support providing vision and guidance to the organization responsible for gas distribution. Within this workgroup are labor and non-labor expenses associated with developing and maintaining distribution construction standards; evaluating new field technologies; field training; training distribution welders; providing code required welder testing;

providing welding inspection; managing the OpQual program; managing the Welding School, supervision/management/administrative, and miscellaneous expenses related to Gas Distribution O&M. Table LPK-25 summarizes Gas Distribution O&M costs associated with Operations Management, Supervision, and Training.

TABLE LPK-25
Operations Management, Supervision, and Training

GAS DISTRIBUTION (In 2021 $)			
K. Operations Management, Supervision, & Training	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Operations Management, Supervision & Training	9,003	9,128	125
Total	**9,003**	**9,128**	**125**

1. Description of Costs and Activities

Field training for SDG&E's Gas Distribution personnel accounts for the majority of the 2021 adjusted-recorded base spending in this workgroup. Gas construction employees attend training because they are new to their job, require operator qualification, need refresher training, are promoted to a position requiring additional technical skills, and/or need additional training due to the deployment of new equipment with new technology or changes in regulations. These field expenses include general training costs for SDG&E District Operating Centers and technical services personnel.

Another significant source of expenditure in this workgroup is in field supervision. Field managers and supervisors have one of the most challenging and critical positions at SDG&E. They are responsible for the supervision and inspection of field construction and maintenance work performed by both SDG&E crews and by contractor crews. They are in a position of influence with front-line employees and are responsible for coaching and mentoring these employees to work safely, follow Company procedures, and maintain and build a safe and reliable natural gas delivery system.

An additional area of expense in this workgroup is comprised of miscellaneous operating expenses. These non-labor expenses include office supplies, telephone expenses, mileage expenses, and professional dues.

This workgroup also includes three RAMP items: Excavation Damage (Dig-In) on the Gas System – Locate and Mark Training,[34] Incident Related to the Medium Pressure System (Excluding Dig-in) – Human Factors Mitigations – Operator Qualification Training and Certification,[35] and Incident Related to the Medium Pressure System (Excluding Dig-in) – Human Factors Mitigations – QA/QC Program – Mandated Compliance Activities.[36]

a. RAMP Activities

The activities in this work group which are mitigation measures supporting safety risks are:

Locate and Mark Training **-** This RAMP control includes all of the training, OpQual, excavation, and refresher/competency training for a locator to perform the Locate and Mark Activity. The Locate and Mark Activity is to prevent damage to the SDG&E infrastructure. The activity includes (1) locating and marking underground gas, electric, fiber optic facilities before excavation occurs; (2) observing (stand-by) pipeline excavation activities; and (3) providing staff support for compliance and improvement.

Human Factors Mitigations – Operator Qualification Training and Certification **-** All gas pipeline operators are required to create and maintain a written Op Qual program to establish compliance policies for the Department of Transportation (DOT) Operator Qualification Program as required by 49 CFR Subpart N – Qualification of Pipeline Personnel. All employees and contractors performing DOT-covered tasks are required to be pre-qualified per this Op Qual program. Such programs are reviewed by the Operator Qualification department prior to performing work on pipelines or pipeline facilities. The Op Qual program requires that employees are trained, initially qualified and subsequently re-qualified every three or five years depending on the task. SDG&E's training frequency conforms to these requirements and the results of the evaluations are recorded, demonstrating employees' knowledge, skills, and abilities of the job requirements and that they are qualified to perform the required tasks. Qualification promotes adherence to proper Company policy and procedures and therefore mitigates the risk of

[34] A.21-05-011 SDG&E-Risk-7 Excavation Damage (Dig-In) on the Gas System.

[35] A.21-05-011 SDG&E-Risk-9 Incident Related to the Medium Pressure System (Excluding Dig-in).

[36] *Id.*

hazardous conditions developing and increases the overall awareness and response to unsafe activities.

Human Factors Mitigations – QA/QC Program – Mandated Compliance Activities - In addition to SDG&E's Operator Qualification program to promote operations are performed in a safe and proficient manner, SDG&E performs quality control checks for various pipeline operational activities as mandated by 49 CFR § 192.605 (b8) (c4). During these quality control checks; internal assessors review the work performed by gas pipeline personnel to determine the effectiveness and adequacy of the procedures used in normal operations and maintenance. In addition, the assessors validate the conformance of employees to these policies and procedures. The assessors identify if abnormal operating conditions (AOCs) are present and that the employees respond to the AOCs and take appropriate corrective actions. SDG&E performs quality control assessments on the Company's regulator station, valve, and large meter set inspection and maintenance activities, as well as on pipeline monitoring activities, and cathodic protection activities. These assessments are tracked and recorded to communicate lessons learned and to help develop refresher training. Adherence to proper company policy and procedures mitigates the risk of hazardous conditions developing and increases the overall awareness and response to unsafe activities.

Table LPK-26 below provides the RAMP activities and their respective cost forecasts, for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-WP (1GD010).

TABLE LPK-26
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – 1GD010 **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE***
SDG&E-Risk-7 - C01	Locate & Mark Training Groupings	746	746	0	0
SDG&E-Risk-9 - C14	Human Factors Mitigations - Ops Qual Training	1,661	1,661	0	0.5
SDG&E-Risk-9 - C15	Human Factors Mitigation - QA/QC Program	300	300	0	0

* RSEs were not calculated for activities with a 0 value.

2. Forecast Method

In projecting the future expense requirements for these functions, SDG&E reviewed the 2017 through 2021 historical spending for this entire workgroup. In general, operations leadership, field management, operations support, and personnel training increase as levels of work and workforce increase; as new programs, processes, and technologies are implemented; and as regulatory or compliance requirements change. An increase in training and OpQual program development and expansion began in 2017 and continued through 2021. This increased level of training and operator qualifications activity is expected to continue in the forecast years. Because of these recent work elements and associated expense level changes, a historical average would not represent future resource needs. For this reason, the 2021 base year was selected as the appropriate forecast methodology. Added to this 2021 base expenditure level are incremental additions necessary to adequately fund the activities in this workgroup in TY 2024.

Incremental additions for this workgroup include:

a. Night Welding Class

Incremental costs for a Night Welding Class – A night welding class will be established to provide preparation instruction as a pre-school for the day welding classes. Labor charges to

this class will be 30% O&M. The total incremental funding needed for this workgroup element is $10,000 over the base forecast for TY 2024.

b. Instructional Additions – Two Senior Welding Instructors

Incremental additions will be added to meet increased O&M and capital demands on welding, welding training, and welding inspection. These positions will also help promote training competencies. These positions will charge 25% of their time to O&M. The total incremental funding needed for this workgroup element is $58,000 over the base forecast for TY 2024.

c. Technical Advisor Addition - One Operator Qualification Compliance Advisor

An incremental addition of One Operator Qualification Compliance Advisor is required to provide necessary span of control oversight due to the growth in the number of Company and contract employees requiring compliance with Operator Qualification. In addition, one Non-Destructive Examination (NDE) Program Supervisor is required to mitigate any compliance issues directly pertaining to the Company's NDE Program. These positions will charge 10% of their time to O&M. The total incremental funding needed for this workgroup element is $27,000 over the base forecast for TY 2024.

d. Develop Virtual Training

Incremental cost associated with virtual training will be established to provide enhanced training for field activities that present a greater risk and are difficult to replicate in real-life scenarios, but that can be safely simulated within Virtual Reality applications. This training will charge 30% to O&M. There is no labor expense. The total incremental funding needed for this workgroup element is $30,000 over the base forecast for TY 2024.

The selection of the base year recorded, including incremental additions, results in an increase of $125,000 from the 2021 adjusted recorded base in TY 2024.

3. Cost Drivers

The forecast for the Operations Management, Supervision, and Training workgroup is driven by costs in four major areas: operations leadership, field management, operations support, and personnel training. In general, costs in these areas increase as levels of work and workforce increase; as new programs, processes and technologies are implemented; and as regulatory or

compliance requirements change. As such, the work environment within Operations Management, Supervision, and Training is increasingly influenced by, and evolving with multiple drivers:

- Continued compliance with current regulations. Since the San Bruno incident in Northern California, SDG&E has experienced continual regulatory pressure to establish more strict compliance assurance mechanisms. This was evidenced by the issuance of GO 112-F and several federal regulations including 49 CFR § 192.607[37]. This continues to drive costs associated with emergency response, more quality assurance oversight into operations, and a need for additional compliance technical advisors and assistants for analysis and implementation of the regulations into operation procedures and standards.
- The need to maintain a trained and qualified workforce. SDG&E is taking proactive action to address employee training and qualification through the continued expansion of its OpQual program; additional instructors, established subject matter experts, and instructional designers for training program development.
- The need to support new field technologies and to facilitate the integration of these tools within the field and overall management practices. This drives costs associated with increased technical business support and identification and implementation of system enhancements. Included in this is the GO 112-F requirement that equipment and facilities used by an operator for training and qualification of employees must be identical, or very similar in operation to the equipment and facilities which the employee will use, or on which the employee will perform the covered task.
- The need to maintain data integrity and leverage new information depositories. This drives costs associated with reports and tools that will gather, consolidate, and summarize newly available data to develop compliance reports and to monitor the effectiveness of operations and identify future business improvements. It should be noted here that requirements of GO 112-F added 25 additional reporting requirements.
- Increased workforce turnover. Workforce turnover presents issues of knowledge transfer, skills development, and overall proficiency of the replacement workforce. This drives costs related to training, Operator Qualification, technical support, and Quality Assurance.
- Introduction of new construction and maintenance methods into office and field functions drive costs associated with the personnel needed to revise Gas Standards and training materials, conduct refresher training, project management

[37] *See* 49 CFR § 192.607 - Verification of Pipeline Material Properties and Attributes: Onshore steel transmission pipelines.

and controls, provide technical support, and conduct assessments and enhancements of business processes.

Furthermore, the SDG&E's 2021 RAMP Report identified the need to provide additional job skills, training and qualification, welding construction training, and quality control inspections on pipeline systems.

V. CAPITAL

The driving philosophy behind SDG&E's capital investment plan is to provide safe, reliable delivery of natural gas to customers at reasonable cost. This commitment requires that SDG&E invests in its infrastructure and support services to mitigate risks associated with the safety of the public and employees, service reliability, and gas system integrity. SDG&E installs new pipeline mains, service lines, and meter set assemblies (MSA) to meet the needs of the growing population in the service territory. To maintain system reliability and safety, SDG&E makes a variety of other capital improvements, including pressure betterment projects to improve areas of low pressure, pipeline renewals to replace deteriorated pipelines or obsolete equipment, installation and replacement of Cathodic Protection (CP) systems, the purchase of electronic pressure monitoring devices for pressure tracking and monitoring, and proactively address risk mitigations identified in the 2021 RAMP report, and throughout this testimony, including completing pipeline replacements/removals to reduce operational risks in the overall gas system. Other improvements include pipeline relocations to accommodate public infrastructure improvements such as street and highway widening, and relocations caused by the construction of new water, sewer, and railway facilities. To accomplish these activities, SDG&E continuously monitors the condition of approximately 15,328[38] miles of distribution main and service pipelines. By using technology and the professional judgment of experienced, skilled, and well-trained employees, SDG&E utilizes capital in a prudent, responsible manner consistent with local, state, and federal codes and regulations.

In preparing the forecast for capital expenditures, SDG&E Gas Distribution reviewed 2017 through 2021 historical spending levels, including work units, and developed an assessment of future requirements and associated risks. This analysis considered underlying cost drivers to

[38] Total mileage from U.S. Department of transportation Pipeline and Hazardous Material Safety Administration 2021 Annual Report for Calendar Year 2021 Gas Distribution System, OMB NO: 2137-0629.

determine if historical patterns of spending should be expected to continue, as well as the degree of impact of associated RAMP risk mitigations. Additionally, where the capital improvement project was new without prior history, or a separate forecast calculation method was used, a zero base methodology was chosen. Forecasting was based on recent experience in construction, units of construction or work activity, while adding recent experiences to modernize the gas infrastructure to support California's climate policy and SDG&E's goal of Net Zero GHG emissions by 2045. Gas Distribution also evaluated future work requirements that were incremental to levels of historical spending, yet necessary to maintain the safe and reliable operations of the distribution system.

Thus, the forecasting methodologies varied depending on the type of activity being analyzed and the expectations of future system needs. These methods included forecasts based on historical averages, on historical growth and estimated future growth, on identified projects or materials, zero based, and a combination of project specific justification and analysis.

SDG&E's Gas Distribution capital expenditure forecasts are rooted in a historical review of spending and are adjusted, where appropriate, for elements of new work or changes in operating conditions and RAMP risk mitigation which would not have been reflected in the past spending patterns. As such, forecasts address actions that must be taken to manage risks associated with the safety of the public and employees, service reliability, and gas system integrity.

SDGE requests approval of a Litigated Project Cost Memorandum Account (LPCMA) to record the capital-related costs associated with projects that are intended to qualify as a collectible project to be recovered from third-party customers (*e.g.*, Contributions in Aid of Construction from a local government entity) instead of ratepayers, but later are deemed by a court to be non-collectible from third-party customers. Collectible costs are costs that SDG&E expects to collect from third parties (*i.e.*, not to be collected from ratepayers). For example, in some situations, a local governmental entity (*e.g.*, San Diego) may be responsible for certain costs associated with relocating utility infrastructure as part of a development project. In this example, such costs are considered collectible because they are to be collected from the city. Non-collectible costs are costs that are not expected to be collected from a third party and instead are treated as costs to be collected from ratepayers. A situation may arise in the context of utility disputes with public entities over who should pay for the relocation of utility facilities

necessitated by municipal or other public entity projects, such as water, sewer, or transit projects. For instance, while the utility may argue in a litigated proceeding that the public entity should bear the relocation costs, courts may rule otherwise.

If a court rules that a utility must bear the costs of the activity – effectively deeming the costs as non-collectible -- SDG&E will record to the LPCMA any historical capital-related costs (*i.e.*, depreciation, return, and taxes) based on the timing of when the project went into service, no earlier than the effective date of SDG&E's TY 2024 GRC Decision. For example, if a court rules a project is non-collectible in late 2024 and it had gone into service in 2023, capital-related costs would be recorded to the LPCMA as of January 1, 2024, or the effective date of the TY 2024 GRC. Memorandum account treatment for these costs is reasonable and just as it will allow SDG&E the opportunity to litigate, where appropriate, whether the third-party customer should bear the costs at issue, while preserving the ability to later seek recovery of the incremental capital-related costs from ratepayers associated with projects that can no longer be collected from a third-party customer, if the litigation proves unsuccessful.

SDG&E would not record revenue requirement prior to any ruling for tracking purposes and would treat as a collectible project consistent with its understanding. If thereafter a project is deemed non-collectible, SDG&E proposes to record any historical revenue requirement associated with the project based on the timing of when the project went into service, no earlier than January 1, 2024. Any costs recorded to the memo account would be subject to a reasonableness review prior to inclusion in rates and rate base. Additionally, costs recorded in the LPCMA may be addressed in a GRC or other applicable proceeding. SDG&E seeks authorization for the LPCMA in this GRC to avoid the prohibition against retro-active ratemaking, and therefore, requests Commission approval of the LPCMA. Refer to Mr. Kupfersmid's Regulatory Accounts testimony for details on the LPCMA (Ex. SDG&E-43).

To continue to provide safe and reliable service, while mitigating associated risks, SDG&E requests the Commission adopt forecast capital costs of $132,585,000, $135,392,000, and $122,799,000 for 2022, 2023, and 2024 respectively.

Table LPK-29 summarizes the total capital forecasts for the forecast years.

TABLE LPK-29
Capital Expenditures Summary of Costs

GAS DISTRIBUTION (In 2021 $)				
Categories of Management	**2021 Adjusted-Recorded (000s)**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
A. New Business	8,613	19,658	13,042	9,928
B. System Minor Additions, Relocations, and Retirement	5,412	5,221	5,221	5,221
C. Gas Meters & Regulators	8,374	8,598	9,348	9,348
D. Gas System Reinforcement	1,610	529	529	529
E. Street & Highway Relocation	6,733	14,596	15,008	5,776
F. Tools & Equipment	3,659	5,006	4,006	3,936
G. Code Compliance	3,101	2,712	3,087	3,087
H. Leak Repair	10,082	11,935	12,973	14,010
I. Cathodic Protection Program	4,409	4,493	4,493	4,493
J. Cathodic Protection System Enhancements	2,919	1,996	1,996	1,996
K. System Reliability & Safety	645	1,956	3,456	1,956
L. Underperforming Steel Replacement Program – Threaded Main (Pre-1934 Vintage)	13,682	7,000	7,000	7,000
M. Underperforming Steel Replacement Program (1934-1965 Vintage)	14,712	3,000	3,000	3,000
N. Underperforming Steel Replacement Program – Other (Post-1965 Vintage)	4,207	3,001	3,001	3,001
O. Early Vintage Program – Dresser Mechanical Coupling Removal	3,934	2,000	2,000	2,000

GAS DISTRIBUTION (In 2021 $)				
Categories of Management	**2021 Adjusted-Recorded (000s)**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
P. Early Vintage Program – Oil Drip Piping Removal	3,668	1,500	1,500	1,500
Q. Early Vintage Program – Removal of Closed Valves between High/Medium Pressure Zones	893	1,500	1,500	1,500
R. Piping in Vaults Replacement Program	2,925	1,500	1,500	1,500
T. Control Center Modernization (CCM) Project	0	449	3,235	4,080
U. Curb Valve Replacement	0	1,000	1,750	1,750
V. CNG Station Upgrades	0	137	137	137
W. Local Engineering Pool	23,764	22,990	25,112	24,574
X. Gas Distribution Overhead Pool	8,097	5,342	5,695	5,893
Y. Gas Distribution Contract Administration Pool	8,717	6,466	6,803	6,584
Total	**140,158**	**132,585**	**135,392**	**122,799**

A. New Business (500)

TABLE LPK-30
New Business (500)

GAS DISTRIBUTION (In 2021 $)				
A. New Business (500)	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. New Business (NC)	8,613	7,749	9,172	9,068
2. Collectable (CO)		11,909	3,870	860
Total	**8,613**	**19,658**	**13,042**	**9,928**

1. Description

The New Business budget code provides for changes and additions to the existing gas distribution system to connect new residential, commercial, and industrial customers. This includes installations of gas mains and services, meter sets, purging of customer house lines which is a RAMP activity, Field and Public Safety, and the associated regulator stations necessary to provide service to the customer. The material cost of meters and regulators are addressed under Section V.C (Gas Meters & Regulators (502)).

This budget code also captures two large collectible new business projects that the Company is installing at Camp Pendleton base for the Marine Corps. The first is a conversion of Marine Corps owned gas pipe to SDG&E owned, operated, and maintained state of the art pipe at the Stuart Mesa housing community. The second is the install of new high pressure and medium pressure distribution equipment and approximately 16,000’ of 6” plastic pipe along Cristianitos road.

These forecasted capital expenditures support the Company’s goals of providing a safe and reliable gas distribution system and responding to its obligation to serve the growing customer base, thus mitigating the risk of reduced service reliability.

For this cost category, SDG&E’s proposed LPCMA, discussed in the introduction of the Capital Section above, would apply if associated costs are later deemed to be non-collectible.

a. RAMP Activities

The RAMP mitigation measure that supports the mitigation of safety risks in this work group is Field and Public Safety. Field and Public Safety includes the purging of customer houselines. Purge orders are issued to promote customer safety by confirming customer owned

gas houselines are safe and leak-free and odorant is readily detectable. Purge orders usually involve large gas meter installations and customer owned gas systems for multifamily residential, commercial, and industrial customers. These jobs usually relate to new construction projects where Gas Distribution Pipeline Operations sets a large gas meter and the Company schedules a date for Customer Service Field to test and purge the houseline.

Table LPK-31 below lists the RAMP activities and their respective cost forecasts, and the RSE for this workpaper. For additional details on this RAMP activity, please refer to my workpaper SDG&E-04-CWP (500).

TABLE LPK-31
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – New Business (500) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE**
SDG&E-Risk-9 - C19	Field and Public Safety	569	569	569	0.03

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

A zero-based forecast for New Business expenditures was developed using the projected number of new meter sets added to the Gas Distribution system. SDG&E forecasts a continued growth in new customer meter installations. Table LPK-32 below shows the quantity of new meter sets SDG&E installed in the period 2017 through 2021 and the new meter installation forecasts for the years 2022 through 2024. For additional details on the calculation of new meter set installations, please refer to the workpaper of Mr. Wilder, Ex. SDG&E-39-CWP.

Table LPK-32
San Diego Gas & Electric Company
New Business Meter Installation History and Forecast

Year	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Number of New Meter Set Installations	6836	6701	6398	6740	4789	6201	7340	7256

The expenditures for this budget code were forecasted by multiplying a three-year average (2019 through 2021) adjusted recorded labor and non-labor cost per meter installation by the meter forecast quantities in years 2022, 2023, and 2024. The gross forecast of expenditures was separated into two components: the "non-collectable" construction cost for labor and non-labor necessary to install new business additions, and the "collectable cost" (CO) or Contributions In Aid of Construction (CIAC) portion that supports these installations. The collectable cost of a project (CO or CIAC) is an amount of money collected from the customer that is applied toward the cost of construction for services rendered and/or facilities installed. The collectable costs for a project vary from project to project. Therefore, in order to forecast this fluctuating portion of new business expenditures, it is necessary to derive a factor that represents the average percentage of direct CIAC per direct construction costs.

This CIAC factor was developed by dividing the annual direct CIAC credits collected by the total direct construction costs in a given year and averaged over the 2019 through 2021-time period. This factor was applied to the 2022 through 2024 gross forecast of construction costs, yielding the New Business Collectable component of the forecast. The forecasted collectable expenditures for New Business in 2022, 2023, and 2024 include the labor and non-labor costs for installations of new large distribution gas mains or upgrades in size of existing distribution gas main to serve new loads for any new customers.

The forecasted non-collectible expenditures for New Business in 2022, 2023, and 2024 include the labor and non-labor costs of the RAMP Field and Public Safety Mitigation. This includes the purging of customer houselines. Purge orders are issued to promote customer safety by confirming customer owned gas houselines are safe and leak-free and odorant is readily detectable. Purge orders usually involve large gas meter installations and customer owned gas systems for multifamily residential, commercial, and industrial customers. These jobs usually relate to new construction projects where Gas Distribution Pipeline Operations sets a large gas meter and the Company schedules a date for Customer Service Field to test and purge the houseline.

Forecasted total (gross) expenditures for New Business in years 2022, 2023, and 2024 are $19,658,000, $13,042,000, and $9,928,000 respectively. The forecasted collectable expenditures for New Business in years 2022, 2023, and 2024 are $11,909,000, $3,870,000, and $860,000, respectively. The remaining forecasted non-collectable expenditures for New Business in years

2022, 2023, and 2024 are $7,749,000, $9,172,000, and $9,068,000, respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

New Business work is driven by the volume and type of new construction required to provide service to new residential, commercial, and industrial customers, thus mitigating the risk of reduced service reliability and complying with the Company's obligation to serve. As described above, this includes the installation of new mains and services to bring gas to new developments, meter sets, and purging customer houselines. In some cases, it is also necessary to build high-pressure supply lines and associated regulator stations.

In SDG&E's experience, new construction increases as the economy improves. As referenced in Mr. Wilder's testimony (Ex. SDG&E-39-WP), SDG&E forecasts an increase in new business growth in the next several years, and it is therefore reasonably anticipated that demand for construction resources and material will increase. The underlying cost drivers for this capital category relate to Company labor, contractor services, third party services, paving services, and materials such as pipe and fittings.[39]

All or a combination of these construction elements are necessary for performing New Business facility installations.

B. System Minor Additions, Relocations, and Retirements (501)

TABLE LPK-33

GAS DISTRIBUTION (In 2021 $)				
B. System Minor Additions, Relocations, and Retirements (501)	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. System Minor Additions, Relocations, and Retirements (NC)	5,412	3,924	3,924	3,924
2. Collectable (CO)		1,297	1,297	1,297
Total	**5,412**	**5,221**	**5,221**	**5,221**

[39] On November 16, 2021, Energy Division staff issued a proposal recommending the elimination of gas line extension allowances, refunds, and discounts for new customers and all customer classes effective July 1, 2023 (sunset date) in the Order Instituting Rulemaking Regarding Building Decarbonization (Rulemaking 19-01-011) (Building Decarb OIR). If necessary, SDG&E will submit revised testimony in accordance with the outcome of this proposal.

1. Description

This budget code captures expenditures not covered in other work categories that are required to maintain the continued integrity of SDG&E's Gas Distribution system. Examples of expenditures include gas distribution main and service additions, main and service abandonment, and main and service relocations due to customer requests or Company requirements.

For this cost category, SDG&E proposed that LPCMA, discussed in the introduction of the Capital Section above, would apply if costs associated with customer requests are later deemed to be non-collectible.

a. RAMP Activities

There are two activities in this work group supporting the mitigation of safety risk: The Adobe Falls Relocation project and the RAMP Incremental-Mitigate MSA's inside Buildings and Alcoves.

Adobe Falls Relocation Project – Involves supply line SL-49-17-H which is a 6" 400 PSIG maximum allowable operating pressure (MAOP) pipeline crossing the Interstate Highway-8 along the Alvarado Canyon. The alignment of the pipe, which runs through several residential properties, down a very difficult to access steep hillside, and through an environmentally sensitive creek bed (Alvarado Canyon), make it very challenging to meet the required 49 C.F.R. § 192.723 leak survey, maintenance, and potential repair activities for this high pressure pipeline. To mitigate concerns, this pipeline will be retired from service and a new distribution high pressure supply line will be installed within franchise along Alvarado Road and Canyon Crest Drive. This will be done in order to maintain service to the San Diego State University facilities, which includes the University's independent cogeneration facility and the surrounding residential area.

Mitigate MSAs inside Buildings and Alcoves – The MSAs inside Buildings and Alcoves project came as a result of a recommendation from the National Transportation Safety Board (NTSB) following a natural gas explosion in Silver Spring Maryland on August 10th, 2016.[40] The recommendations include:

[40] Pipeline and Hazardous Materials Safety Administration (PHMSA); DOT. Agency/Docket Number: Docket No. PHMSA-2020-0115, Document Number: 2020-21507.

- Require that all new service regulators be installed outside occupied structures.[41]
- Require existing interior service regulators be relocated outside occupied structures whenever the gas service line, meter, or regulator is replaced. In addition, multifamily structures should be prioritized over single-family dwellings. To help mitigate this risk, SDG&E plans to verify all identified MSA's that are enclosed or could potentially be enclosed, and remediate any hazards found. [42]

Table LPK-34 below lists the RAMP activities and their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (501).

TABLE LPK-34
RAMP Activities O&M Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – System Minor Additions, Relocations, and RFS (501) RAMP Activity Capital Forecasts by Workpaper (In 2021 $)					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-3 - M04	Adobe Falls Relocation Project	2,192	1,891	0	-
SDG&E-Risk-9 - M04 (New)	RAMP Incremental: MSAs inside Buildings & Alcoves	1,400	1,400	0	-

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

In developing the forecast, historical expenditures from 2019 through 2021 were evaluated. Due to the wide range of activities recorded in this workgroup, as well as the cost fluctuations from year to year, a three-year (2019 through 2021) average was selected as the best method to forecast future costs.

In developing the base forecast for this budget code, labor and non-labor components were evaluated separately. The labor component contains the historical Company labor charges

[41] *Id.*

[42] *Id.*

associated with construction projects within this budget category. A three-year average (2019 through 2021) was utilized as the forecasting methodology for this component.

Within non-labor, there are two distinct cost components: (1) construction materials and services, and (2) CIAC credits. The first non-labor component, construction materials and services, was forecasted using a three-year average (2019 through 2021). The second component, CIAC credits, was also calculated based on a three-year average (2019 through 2021). As previously discussed in the New Business budget code, the collectable cost portion of a project (or CIAC credits), is an amount of money collected from the customer that is applied toward the cost of construction for services rendered and/or facilities installed.

The forecasted gross expenditures for budget code 501 in years 2022, 2023, and 2024 are $5,221,000, $5,221,000, and $5,221,000 respectively. The forecasted collectible expenditures for Budget Code 501 in years 2022, 2023, and 2024 are $1,297,000 per year. The forecasted non-collectible expenditures for Budget Code 501 in years 2022, 2023, and 2024 are $3,924,000 per year. For additional details refer to Ex. SDG&E-04-CWP.

Included in the base level of expenses, are the embedded costs associated with the 2021 RAMP Report: Incident Related to the High Pressure System (Excluding Dig-in) –M04[43] and 2021 RAMP Report: Incident Related to the Medium Pressure System (Excluding Dig-in) Incremental (NEW)–M04.

3. Cost Drivers

The costs included in this budget code relate to expenditures not covered in other work categories that are required to maintain the continued integrity of SDG&E's Gas Distribution system. Costs are primarily driven by the volume and type of construction required to address the needs of property owners requesting SDG&E to move its facilities from their property; or to meet the Company's need for minor additions, facility relocations or abandonments to address conflicts, integrity, or reliability concerns. Examples include the number of customer house-lines or gas service lines to be relocated and/or abandoned, which is generally driven by economic conditions.

[43] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-3, Incident Related to the High Pressure System (Excluding Dig-in).

The underlying cost drivers for this capital work category relate to Company labor, contractor service, third-party services, paving services, and materials, such as pipe and fittings. All or a combination of these construction elements are necessary for performing pipeline installations for this budget category.

C. Gas Meters & Regulators (502)

TABLE [LPK]-35
Gas Meters & Regulators (502)

GAS DISTRIBUTION (In 2021 $)				
C. Gas Meters & Regulators	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Gas Meters & Regulators	8,374	8,598	9,348	9,348
Total	**8,374**	**8,598**	**9,348**	**9,348**

1. Description

This budget code provides for the capital material expenses for purchasing new residential, commercial, and industrial gas meters and pressure regulators. Meters and regulators installed or replaced are grouped in three general categories:

- New business installations;
- Routine replacements; and
- Planned meter and regulator replacements.

These purchases, and the subsequent installations, are necessary for accurate billing, reliability, and safe operation. The expenditures included here are for the materials costs only. The associated installation expense is covered in other applicable budget categories (*e.g.*, New Business (500) and Code Compliance (507)).

Meters and regulators are purchased for installation at new customers' premises. Purchases in this category are consistent with forecasts discussed in Section V.A (New Business (500)) of this testimony.

A routine replacement is a reactive replacement of the meter resulting from either a Company or customer-identified problem with meter accuracy or operation such as customer trouble calls, customer billing complaints, and replacements due to meter failures or damage. Routine meter changes have remained relatively constant from year to year. Small meter routine replacement labor is addressed by Mr. Thai (Ex. SDG&E-17).

Planned meter and regulator replacements are proactive replacements based on results of a statistical sampling of meter accuracy, age, and performance. These replacements are targeted based on a program to achieve gas measurement accuracy. GO 58-A requires that gas meters employed by SDG&E measure gas volume to a certain level of accuracy or be removed from service for repair or replacement. Meters are removed consistent with the Gas Meter Performance Control Program.

2. Forecast Method

Forecasted expenditures for meters and regulators are based on forecasted quantities for new business, the trending of usage for routine replacements, as well as planned meter replacements and therefore is a zero-based forecast. The forecasted usage is multiplied by the current meter and regulator contract prices to estimate future expenditures. Small meter routine replacements and planned meter replacements are based on the information covered by Mr. Thai (Ex. SDG&E-17).

Forecasted expenditures for Meter and Regulator Material in years 2022, 2023, and 2024 are $8,598,000, $9,348,000, and $9,348,000, respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

The main cost drivers for this capital work category consist of meeting projected new business requirements, routine meter replacements, and planned meter replacements. New business meter and regulator purchases in this category are consistent with installations discussed in Section V.A. (New Business (500)). Meters purchased for routine replacements are in response to Company or customer-identified problems due to meter accuracy, age, or operation. Planned meter replacements are meter families in the Gas Meter Performance Control Program that fail accuracy limits, based on meter statistical sampling.

D. Gas System Reinforcement (503)

TABLE LPK-35
Gas System Reinforcement (503)

GAS DISTRIBUTION (In 2021 $)				
D. Gas System Reinforcement	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Gas System Reinforcement	1,610	529	529	529
Total	**1,610**	**529**	**529**	**529**

1. Description

Recorded in this budget code are expenditures for Gas Distribution pressure betterment projects performed on an ongoing basis to maintain system reliability and service to all customers. Gas System Reinforcement projects are performed in areas where there is insufficient capacity or pressure to meet load growth and in areas where a strategic pipeline backtie would be beneficial for system reliability. Gas System Reinforcement projects are necessary to maintain reliable service to existing customers as new gas load is added to the gas distribution system.

Once a pipeline system is designed and installed, the capacity remains relatively fixed. However, as load increases from new business activities or from expansion of existing customer loads, over time the existing pressure decreases which reduce the available volume for new and existing customers. If the diminishing pressure is not addressed, gas service to customers could be interrupted.

To determine areas in need of system reinforcement, growth information is gathered from customers, builders, city, county, and state agencies. In addition, SDG&E collects data from electronic pressure data recorders. This information is used to run model simulations on system flow and identify capacity constraints. Based on analysis of these constraints, region engineering personnel identify specific system reinforcement projects and the estimated year in which the project will need to be constructed. The projects are constantly reprioritized as the timelines for new developments change and economic conditions fluctuate. These projects typically involve installing new mains and, when necessary, regulator stations, or upgrading existing mains and regulator stations.

Gas System Reinforcement capital expenditures support the Company's goals of providing safe, reliable service to customers, thus mitigating the risk of adverse impacts to system reliability. This work category addresses critical areas of the distribution pipeline network that are most susceptible to pressure drops to alleviate the potential risk of loss of service to customers.

2. Forecast Method

SDG&E's gas infrastructure is a large dynamic system of pipelines and pipeline connections, with continual changes in customer load and construction activity. System reinforcement projects are prioritized utilizing the latest load and growth information available. In addition, the timing to complete each project can be unpredictable due to the need for detailed planning requirements, acquiring the required permits, and coordination and scheduling of resources. Therefore, the cost forecast for the years 2022 through 2024 is based on a historical four-year average of recorded expenditures for the years 2018 through 2021. This average captures the yearly variations in system reinforcement requirements which vary with constantly changing new construction development schedules, economic conditions, and large customer system impacts.

Forecasted expenditures for Gas System Reinforcement in years 2022, 2023, and 2024 are $529,000 per year.

3. Cost Drivers

The main drivers for Gas System Reinforcement projects are the growth in gas load as a result of new customers and the increased gas usage of the existing customers and to improve the reliability of the gas system by installing strategic gas pipeline ties. This work supports the Company's need to mitigate system reliability risk and to comply with the Company's obligation to serve. After years of customer growth, portions of the gas system operate close to their maximum capacity and additional gas load creates system constraints increasing the need for system reinforcement thus mitigating reliability risk and the potential for customer outages.

As discussed in Mr. Wilder's testimony (Ex. SDG&E-39), a driver of new customer growth is economic conditions. Thus, as the economic conditions continue to improve over the forecast period, it is reasonable to expect a continued need for system reinforcement improvements.

The underlying cost drivers for the Gas System Reinforcement capital budget code relate to company labor, contractor services, third party services, paving services, and material cost. All or a combination of these construction elements are necessary for performing facility installations.

E. Street & Highway Relocation (505)

TABLE LPK-36
Street & Highway Relocation (505)

GAS DISTRIBUTION (In 2021 $)				
E. Street & Highway Relocation (505)	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Street & Highway Relocation (NC)	6,733	5,776	5,776	5,776
2. Collectible (CO)		8,820	9,232	
Total	**6,733**	**14,596**	**15,008**	**5,776**

1. Description

The Pipe Relocation-Franchise and Freeway budget code provides funding for the required relocation of existing gas facilities when necessitated by public improvements. Generally, the work involves a change in alignment or elevation of existing gas pipelines and associated facilities and is driven by local and state agency requirements. At the local level, SDG&E has franchise agreements that require the gas infrastructure to be moved if it conflicts with city and county projects. These agreements obligate SDG&E to perform this work.

The City of San Diego has been one of the largest drivers of funding required for this budget code. The level of typical relocation work driven by city projects, outside of major, one time only, large relocation projects have remained reasonably stable during the 2019 through 2021 timeframe. One exception to this will be the City of San Diego Pure Water project slated to begin major construction in 2022.

Pure Water San Diego is the City of San Diego's phased, multi-year program that will provide more than 40% of San Diego's water supply locally by the end of 2035.[44] As a result of the Pure Water Project, SDG&E will be required to relocate portions of existing high pressure

[44] The City of San Diego Public Utilities, *Pure Water San Diego, available at:* https://www.sandiego.gov/public-utilities/sustainability/pure-water-sd.

and medium pressure gas pipelines currently in conflict with the proposed water pipeline alignment.

In addition to the City of San Diego's projects, SDG&E serves 17 additional cities and one county within its service territory that also impact this budget code with relocation projects. Future improvement projects from these municipalities are anticipated to continue to impact the expenditures in this capital account.

These forecasted capital expenditures support compliance with the provisions of applicable third-party utility agreements.

For this cost category, SDG&E's proposed LPCMA, discussed in the introduction of the Capital Section above, would apply if associated costs are later deemed to be non-collectible.

2. Forecast Method

The timing and the number of franchise pipeline projects is driven by outside agencies; therefore, expenditures in this budget category are dependent on the number, extent, and timing of these requests, and are largely outside of the Company's control. A three-year average best represents the base forecast for the GRC period, 2022 to 2024. This average captures the yearly variations in franchise and freeway relocation requirements without the one-time major collectible projects impacting the average and as economic conditions, city, and Pure Water funding fluctuate.

However, when projects do occur, SDG&E must complete its portion of the work while minimizing schedule delays for the agencies involved. This budget code incorporates the collectable cost portions associated with the Pure Water project. This cost, as previously discussed in the New Business budget code, is an amount of money collected from the customer that is applied toward the cost of construction for services rendered and/or facilities installed. In response to the Pure Water project there is expected to be an increase in required medium pressure and high-pressure distribution pipeline relocations, associated with customer driven conflicts.

The forecasted expenditures, including collectible and non-collectible costs, for budget code 505 in years 2022, 2023, and 2024 are $14,596,000, $15,008,000, and $5,776,000 respectively.

3. Cost Drivers

As previously discussed, franchise relocation projects are driven by the volume and type of construction required in response to the requests of external agencies, such as the City and County of San Diego. These agencies submit requests to relocate pipe that would in its current location, interfere with the planned construction or reconstruction of large municipal projects. The work in this budget category includes expenditures associated with compliance with the provisions of the Company's utility franchise agreements. The degree of complexity of each relocation request varies, and often the outside agency's construction schedules change which have a direct impact on SDG&E's costs.

The underlying cost driver for this capital work category relate to company labor, contractor services, third party services, paving services, and materials such as pipe and fittings. All or a combination of these construction elements are necessary for performing franchise and freeway relocation projects for mains, services, and associated facilities.

F. Tools & Equipment (506)

TABLE LPK-37
Tools & Equipment (506)

GAS DISTRIBUTION (In 2021 $)				
F. Tools & Equipment	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Tools & Equipment	3,659	5,006	4,006	3,936
Total	**3,659**	**5,006**	**4,006**	**3,936**

1. Description

This budget code captures expenditures for new tools and equipment required by field personnel to construct, operate, and maintain the gas distribution system. New tools and equipment are replaced due to failure, age, and advances in technology. In addition, SDG&E invests in new tools that provide innovative ways of completing the maintenance and repair of its facilities in order to minimize customer disruptions, improve pipeline facility documentation, improve gas system safety, and improve employee safety. In addition, the following incremental activities are also included in this budget code:

Develop Virtual Training – Virtual training will be established to provide enhanced training for activities that involve higher risk and are difficult to replicate in real-life scenarios,

but that can be safely simulated within Virtual Reality applications.[45] This allows trainees to repeatedly practice crucial scenarios while preventing damage to equipment and avoiding bodily harm. Virtual Reality training allows for real-time feedback, improves the efficiency of skills transfer, increases knowledge retention, and better captures enterprise knowledge within an organization. This portion of the training will charge 70% to Capital, the balance to O&M.

Kleiss Emergency Pipeline Plugging Equipment (Balloon Stopper) for Pipe flow control – To reduce the medium pressure system control time from 3rd party dig-ins and leak repairs, the Kleiss Emergency Pipeline Plugging Equipment will be introduced to the SDG&E Gas Emergency Response Crews (GERC) to supplement the ability to control 3" to 8" diameter medium pressure distribution gas main when valves are not readily available to use.[46]

a. RAMP Activities

There are two activities in this work group that are mitigation measures supporting the mitigation of safety risk: Locating Equipment and Human Factor Mitigations – Operator Qualification Training & Certification.

Locating Equipment – The purpose of the Locating Equipment Program is to utilize technology to standardize locating tools to locate and mark underground infrastructures accurately. The Locating Equipment program will provide employees with standardized locating devices. Employee locating equipment will be replaced as new technology becomes available. Reducing the potential for damage to underground facilities caused by excavation activities requires correct facility markings. Excavators use these markings to know when hand-digging and other safe digging practices should be followed. Finally, providing employees standardized equipment allows for consistent training and use of the equipment to improve locate accuracy.

Human Factor Mitigations – Operator Qualification (OpQual) Training & Certification – All gas pipeline operators are required to create and maintain a written OpQual program to establish compliance policies for the Department of Transportation (DOT) Operator Qualification Program as required by 49 CFR Subpart N – Qualification of Pipeline Personnel. All employees and contractors performing DOT-covered tasks are required to be pre-qualified

[45] BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest, and most reliable energy infrastructure company in America.

[46] *Id.*

per this OpQual program. Such programs are reviewed by the Operator Qualification department prior to performing work on pipelines or pipeline facilities. The OpQual program requires that employees are trained, initially qualified and subsequently re-qualified every three or five years depending on the task. SDG&E's training frequency conforms to these requirements and the results of the evaluations are recorded, demonstrating employees' knowledge, skills, and abilities of the job requirements and that they are qualified to perform the required tasks. Qualification promotes adherence to proper Company policy and procedures and therefore mitigates the risk of hazardous conditions developing and increases the overall awareness and response to unsafe activities.

Table LPK-38 below lists the RAMP activities, their respective cost forecasts, and RSE values for this workpaper. For additional details on this RAMP activity, please refer to my workpaper SDG&E-04-CWP (506).

TABLE LPK-38
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Tools & Equipment (506) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE**
SDG&E-Risk-7 - C13	Locating Equipment	225	225	225	2
SDG&E-Risk-9 - C14	Human Factor Mitigations - OpQual Training & Cert	440	440	440	0.5

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

In developing the forecast, historical expenditures for 2017 through 2021 were evaluated. Tool purchase requirements vary from year to year and are identified during the year, as part of the regular course of maintenance and construction activities. SDG&E expects routine tool purchases to continue as existing tools and equipment reach their useful life expectancies and the level of construction and maintenance activities increase, adding to the number of new employees that must be equipped with tools and equipment. In addition, increases in other capital and O&M work categories drive the need for personnel and therefore, the tools they use

to perform their job. SDG&E evaluates field tools and equipment based on safety, functionality, cost, and quality. Costs are minimized by encouraging sharing between employees and crews when appropriate, and by repairing tools when it is safe to do so. A five-year average was chosen for the base forecast as this average captures the year-to-year variations in tool purchase requirements.

The five-year base forecasted expenditures for budget code 506 in years 2022, 2023, and 2024 are $3,866,000, $3,866,000, and $3,866,000 respectively. Added to this base expenditure level are incremental additions necessary to adequately fund the activities in this workgroup. These incremental additions are the Kleiss Emergency Pipeline Equipment and the Virtual Training described in the Description Section above.

Forecasted expenditures for the capital portion of Virtual Training in years 2022, 2023, and 2024 are $140,000, $140,000, and $70,000 respectively. Forecasted expenditures for the Kleiss Emergency Pipeline Plugging Equipment in years 2022, 2023, and 2024 is $1,000,000, $0, and $0 respectively.

Included in the base level of expenses, are the embedded costs associated with the 2021 RAMP Report: Incident Related to the Medium Pressure System (Dig-in) – C13[47] and 2021 RAMP Report: Incident Related to the Medium Pressure System (Excluding Dig-in) – C14.[48]

3. Cost Drivers

The main driver for capital tools and equipment purchases is the need to continuously equip SDG&E's employees with safe and reliable tools and equipment. Tools and equipment are used by the distribution field personnel for the maintenance and repair of gas pipeline systems. As previously discussed, SDG&E's tools and equipment are exposed to rigorous environments which impact their useful life. Many of the tools and equipment being utilized in the field and training facilities contain sensitive components that are subject to shock, vibration, rain, and dusty conditions which are factors that contribute to the deterioration of the equipment. Furthermore, work increases in other Capital and O&M work categories increase the need for personnel and therefore the tools needed to perform their job.

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[47] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-7, Excavation Damage (Dig-in) on the Gas System.

[48] *See* SDG&E's 2021 RAMP Report, SDG&E-Risk-9, Incident Related to the Medium Pressure System (Excluding Dig-in).

Additional cost drivers for this capital work category include expenditures associated with the purchase of capital tools to replace existing tools due to condition, failure, age, and to improve safety and ergonomics. In addition, SDG&E invests in new tools that provide, through new technology, innovative ways of completing the maintenance and repair of its facilities to minimize customer disruptions, minimize natural gas emission, improve pipeline facility documentation, improve gas system safety, and improve employee safety.

G. Code Compliance (507)

TABLE LPK-39
Code Compliance (507)

GAS DISTRIBUTION (In 2021 $)				
G. Code Compliance	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Code Compliance	3,101	2,712	3,087	3,087
Total	**3,101**	**2,712**	**3,087**	**3,087**

1. Description

This budget code provides funds for upgrades or additions to facilities to maintain compliance with minimum federal safety standards for gas pipelines, 49 C.F.R. § 192 and state safety standards under GO 112-F.

There are four main areas that comprise the expenditures represented by the base portion of this budget code. In addition, one other component, respectively, reflects an incremental add to the base forecast. These components include the following:

- Labor for the Regulator Replacement Program for pre-1982 American Meter Type K-Regulators to be removed in compliance with 49 C.F.R. § 192.197(b);
- Labor and materials necessary for the installation of barricades to protect MSAs from vehicular traffic in compliance with 49 C.F.R. § 192.353(a);
- Isolation valves necessary for safe operation of the gas distribution system in compliance with 49 C.F.R. § 192.747; and
- Electronic Pressure Monitors and Electronic Pressure Correctors Replacements.

The four main components of budget code 507 are described in more detail below:

Regulator Replacement Program – Since 1983, SDG&E has been installing regulators that contain an over pressure protection feature. When the regulator senses pressure building within the customer's houseline (*i.e.*, should the pressure level coming out of the regulator

increase beyond acceptable levels), this feature allows the regulator to release the excess pressure through a vent while maintaining an acceptable level of houseline pressure. Regulators installed prior to 1983 (also known as Type K) did not generally possess this feature. In an effort to minimize inconvenience to customers, SDG&E currently replaces these regulators when an employee is on a customer's premises to change the gas meter or when a gas service has been isolated for house pest fumigation as scheduled by the pest control company. The labor cost associated with these regulator replacements are accounted for within this budget code in the historical expenditures. The cost of the regulator material is included in the Meter and Regulator Materials budget code (BC 502).

Barricades to Protect MSAs – Another contribution to this budget code's expenditures is the installation of barricades to protect meter sets from vehicular damage. Barricades are installed to protect the MSA from vehicular traffic at existing customer locations in accordance with 49 C.F.R. § 192.353(a) and GO 112-F. The installation of meter barricades creates a more secure environment at the MSA location, which in addition to increasing public safety, results in increased longevity and performance of the MSA equipment. Furthermore, the increased growth in the SDG&E service territory brings increased population density, creating a higher probability for conflicts with vehicular traffic at MSA locations. Recent trends in architecture to maximize saleable square footage have resulted in less room for MSAs, increasing the demand for meter barricades to protect MSAs.

Isolation Valve Installations – The distribution system continues to grow with the installation of gas mains due to new business. With this comes the need for installation of isolation valves for emergency response or safe operation of the system. Frequently these valves are installed with the installation of the new business main. However, due to the complexity of the network of interconnected gas mains, it is necessary to periodically evaluate the system to provide for adequate valve installations for proper system isolation. If a valve is identified through this process to be necessary for safe operation of a distribution system, a valve is installed, and expenditures accounted for within this budget code.

Electronic Pressure Monitors and Electronic Pressure Correctors – Labor and materials necessary for the installation/replacement of distribution system electronic pressure monitoring devices in compliance with 49 C.F.R. § 192.741(a)-(b); and replacement of aging electronic pressure correctors for core and non-core high volume customers.

In addition to the base forecasted activities above, one additional incremental work element is described below.

Electronic Pressure Monitors and Electronic Pressure Correctors Replacements – Incremental – EPMs are used by SDG&E to remotely monitor distribution pipeline pressures in support of gas system capacity analysis and as a warning system to communicate pipeline system gas pressures that may be outside of normal limits supporting SDG&E's capability to recognize abnormal operating conditions and meet regulatory reporting timeline requirements should overpressure or under pressure conditions occur. The primary purpose of the electronic pressure monitor network is system safety and compliance with 49 C.F.R. § 192.741. SDG&E has approximately 140 pressure districts, or hydraulically independent systems operating at a common pressure downstream of a single or multiple pressure regulator station. EPMs are a vital safety component to provide notification of over/under-pressurization events. When gas pressure rises above or falls below a designated pressure, the EPM triggers an alarm so that SDG&E can take action to correct the pressure issue.

Electronic Correctors (ECs) are connected to core and non-core high volume customers and help to correct the gas meter volume and record the customer's usage information. Because natural gas is a compressible fluid, it changes volume with changes in pressure and temperature. The EC helps to correct the variation in volume thereby ensuring utility bills are accurate.

The EPMs and ECs in SDG&E's infrastructure are aging and require considerable maintenance. New equipment is more reliable, and calibration is more stable. Longer battery life within the units allows for 1-year maintenance schedule to move to a 5-year maintenance schedule.

With exception of the EC and EPM replacements, all of the activities in this work group are RAMP mitigation measures supporting safety risks

Table LPK-40 below lists the RAMP activities and their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (507).

TABLE LPK-40
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Code Compliance (507) RAMP Activity Capital Forecasts by Workpaper (In 2021 $)					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C10	Code Compliance Mitigation	2,662	2,662	2,662	1

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

In developing this forecast, historical expenditures for 2018 through 2021 were evaluated. Because of the wide range of activities recorded in BC 507, as well as the cost fluctuations from year to year, a four-year average was selected to forecast future costs. The four-year base forecasted expenditures for budget code 507 in years 2022, 2023, and 2024 are $2,662,000, $2,662,000, and $2,662,000 respectively. Added to this base expenditure level is the incremental addition described below necessary to adequately fund the activities in this workgroup.

Electronic Pressure Monitors and Electronic Pressure Correctors Replacements – As mentioned above, the EPMs and ECs in SDG&E's infrastructure are aging and require considerable maintenance. SDG&E plans to replace these devices with newer, more efficient equipment. The SDG&E system currently contains approximately 350 EPMs and over 250 ECs that are within scope of replacement over the next several years.

Forecasted expenditures for the EPM and EC replacements for years 2022, 2023, and 2024 are $50,000, $425,000, and $425,000 respectively.

3. Cost Drivers

The Code Compliance budget code is driven by costs associated with each of its principal work components. The main drivers for electronic pressure monitor installations are the need to provide coverage at sites where system pressure is under monitored; and the need to replace existing electronic pressure monitors due to aging and electronic component malfunctions. The main drivers for electronic corrector installations are the need to correct the variation in volume

for large customers thereby ensuring accurate utility billing. Meter barricade installation work is driven by conditions surrounding the location of an existing meter set assembly. Meter barricades are installed to protect the MSA when it is apparent that activity on the property creates a potentially hazardous environment to the MSA. The driver for replacing Type-K regulators is the number found while employees perform other work at the MSA. The driver for isolation valves is the number needed for emergency response and for the safe operation of the system.

The underlying cost drivers for this capital work category relate to company labor, contractor services, third-party services, paving services, and materials such as pipe and fittings. All or a combination of these construction elements are necessary for performing upgrades or additions to facilities to maintain compliance with minimum federal safety standards for gas pipelines.

H. Leak Repair (508)

TABLE LPK-41
Leak Repair (508)

GAS DISTRIBUTION (In 2021 $)				
H. Leak Repair	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Leak Repair	10,082	11,935	12,973	14,010
Total	**10,082**	**11,935**	**12,973**	**14,010**

1. Description

Funding in this all RAMP budget code is required to address compliance requirements for the elimination of potentially hazardous conditions due to leaking or deteriorated gas pipelines. This budget code provides for the replacement of deteriorated Gas Distribution system pipelines to maintain public safety and system reliability. Expenditures in this budget code range from minor pipe replacements to more complex projects. Most minor projects are completed in association with leak investigation and repair work. When the pipe condition is found to be hazardous or the pipeline has conditions, such as a history of leaks, the field and/or technical staff determines replacement options.

The forecasted capital expenditures support the Company's goals of maintaining system integrity and reliability, thus mitigating safety and loss of service risks. Additional main

replacement funding required in response to federal DIMP regulations is addressed by Ms. Kitson and Mr. Sera (Ex. SDG&E-09).

The Leak Repair workgroup mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-42 below lists the RAMP activities and their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (508).

TABLE LPK-42
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Leak Repair (508) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C06	Leak Repair (Capital)	11,935	12,973	14,010	-

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

In developing the main and services replacements forecast, historical expenditures for 2017 through 2021 were evaluated. Spending in this budget category has continually increased over this period due to multiple factors. A variety of factors influence the level of spending on leak repair in a given year. These factors include increasing government regulations, aging infrastructure, public safety, municipality requirements, material failure, infrastructure, economic conditions, and the changes to leak patrol cycles.

Following the discovery of a leak during a survey of the gas distribution system, SDG&E takes steps to either remediate or monitor the situation depending on the type of leak classification. A leak will be remediated immediately if there is a hazardous condition. If the leak does not create a hazardous situation, SDG&E will monitor the leak. SDG&E has shortened the prescribed timeframe for which leaks are monitored and scheduled for remediation. The leak survey program has increased leak survey cycle frequency resulting in increased miles of pipe

surveyed per year. In addition, the introduction of an Aerial Methane Mapping (AMM) pilot[49] as part of the 2022 SB 1371 Compliance Plan, will increase the number of miles of pipe surveyed each year. Given the overall upward trend observed in the historical expenses for this work category, SDG&E selected the five-year linear approach. This forecast methodology best represents the anticipated increasing volume of work on an annual basis and captures the various challenges encountered during leak repair maintenance activities.

Forecasted expenditures for budget code 508 for years 2022, 2023, and 2024 are $11,935,000, $12,973,000, and $14,010,000 respectively.

3. Cost Drivers

The primary cost drivers in this category are the number of leak indications that can impact the integrity of the pipe leading to pipeline repairs and replacements. The additional cost drivers for this capital work category relate to Company labor, contractor services, third-party services, paving services, material cost, and survey cycles. All or a combination of these construction elements are necessary for performing pipeline installations for main replacement work. Regulatory/legislative pressures continue to increase, the infrastructure is getting older, and municipality work, which includes increasing requirements, and general construction continues to increase.

I. Cathodic Protection Program (509)

TABLE LPK-43
Cathodic Protection Program (509)

GAS DISTRIBUTION (In 2021 $)				
I. Cathodic Protection Program	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Cathodic Protection Program	4,409	4,493	4,493	4,493
Total	**4,409**	**4,493**	**4,493**	**4,493**

1. Description

This all RAMP Cathodic Protection (CP) budget code includes expenditures associated with the installation of new and replacement CP systems and equipment in accordance with state and federal pipeline corrosion control standards 49 C.F.R. § 192, Subpart I – Requirements for

[49] *See* SDG&E's 2022 SB1371 Compliance Plan

Corrosion Control and GO 112-F. Examples include the installation of impressed current stations, deep well anode beds, magnesium anode systems, and the purchase of CP instrumentation and monitoring equipment.

Buried steel pipelines that are not well protected, will corrode and revert to their natural state as iron oxide without proper intervention. Corrosion on pipelines increases the risk for leaks and may reduce the useful lives of the pipelines. In addition to the application of coating and electrical isolation, CP is one method for mitigating external corrosion on steel pipelines. CP combats corrosion by imposing an electric current flow toward the surface of the pipeline, which keeps the pipeline negatively charged (cathodic) with respect to the surrounding soil. This results in reduced corrosion on the pipeline system.

CP system shorts and current interference typically occur as SDG&E's pipeline components come into contact with water lines or with third-party grounding systems that can drain current from the pipeline; or near customer meter set assemblies and risers, from improperly grounded customer owned electrical systems and dog or bicycle chains wrapped around risers and meter sets, thus reducing the level of protection and depleting anodes. SDG&E continues to identify necessary modifications to CP systems to accomplish this effort. Associated work includes the installation of insulating unions separating CP systems, new rectifiers, anode beds and test points allowing the CP technician to take CP reads.

These forecasted capital expenditures support the Company's goal of preserving the integrity of steel pipelines by protecting them from external corrosion, thus supporting the mitigation of risks associated with infrastructure integrity, system reliability, and public safety.

The Cathodic Protection Program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-44 below lists the RAMP activities and their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (509).

TABLE LPK-44
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Cathodic Protection (509) RAMP Activity Capital Forecasts by Workpaper (In 2021 $)					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE**
SDG&E-Risk-9 - C02	Cathodic Protection Program - Capital	4,493	4,493	4,493	-

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

SDG&E has approximately 3,564 miles of steel main and approximately 278,000 steel services that are cathodically protected. Expenditures in this work category are associated with new installation and replacement of major CP components and equipment to maintain the integrity of the CP system on these mains and services. Expenditures in this area tend to fluctuate depending on the health of surrounding CP stations, soil conditions, and effective resolution of system shorts. The piping infrastructure continues to age, permitting fees are increasing, drilling prices continue to increase, anode material costs increase, and the need for new or renewed CP stations continues to rise. Furthermore, expenditures in the Cathodic Protection budget code continue to steadily increase as many stations originally installed in the 1975-1995 era are approaching the end of their useful life. CP station splits, renewals, or new additions are required to provide an adequate level of cathodic protection to the aging steel pipeline system.

Given the continuing need to invest in an aging system, a five-year average was selected to forecast future costs.

The forecasted expenditures based on the five-year average for Cathodic Protection in years 2022, 2023, and 2024, is $4,493,000, $4,493,000, and $4,493,000 per year respectively.

3. Cost Drivers

As previously discussed, the main driver for Cathodic Protection work is compliance with DOT Regulation 49 C.F.R. § 192, Subpart I, and GO 112-F, which sets forth the minimum

standards or regulations for corrosion control as well as the need to safeguard the integrity of the pipeline system thus mitigating risks associated with infrastructure integrity, system reliability, and public safety.

The age of the CP system component is also an important cost driver for this work category. As the system components age, their effectiveness decreases, driving the need for additional replacement work. Another work driver is the rate at which anodes deplete, which is impacted by a number of factors including soil moisture and type, electric current interference, and pipe coating effectiveness.

The underlying cost driver for this capital work category relates to municipal requirements, Company labor, contractor services, third-party services, paving services, and materials. This includes new rectifier (impressed current) sites along with associated anode installations including the necessary CP instrumentation; anode bed well replacements for existing rectifier systems; as well as installation of surface bed magnesium anode systems. All or a combination of these construction elements are necessary for cathodic protection projects and to maintain the integrity of the pipeline system.

J. Cathodic Protection System Enhancements (12551)

TABLE LPK-45
Cathodic Protection System Enhancements (12551)

GAS DISTRIBUTION (In 2021 $)				
J. Cathodic Protection System Enhancements	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Cathodic Protection System Enhancements	2,919	1,996	1,996	1,996
Total	**2,919**	**1,996**	**1,996**	**1,996**

1. Description

The all RAMP CP System Enhancement budget code tracks projects specifically associated with creating dedicated high-pressure and medium-pressure distribution pipeline CP system enhancements and the installation of real time monitoring units (RMU) for CP rectifiers.

Currently, SDG&E CP stations cover areas that often include a mixture of high-pressure and medium-pressure pipelines. Typically, CP systems protecting medium-pressure pipelines are more susceptible to shorts compromising CP protection levels. SDG&E has embarked on

creating dedicated CP systems for high-pressure pipelines where any adverse conditions due to corrosion pose a higher risk.

Real Time Monitoring for Cathodic Protection System – The real time monitoring for CP is an embedded expense that is required to continue the installation of equipment for real-time monitoring of the CP system. Electronic monitoring of CP rectifier stations on a real time basis will assist in verifying that the steel pipeline system has an adequate level of protection provided by the rectifier stations in each CP zone. The real-time monitoring unit (RMU) equipment would electronically monitor the rectifier stations on a continuous real-time basis to verify that the level of current from the rectifiers is adequately protecting steel pipelines. The RMUs send alarm notifications through landline or wireless communication to the department monitoring these devices when key parameters such as current levels are below or above a pre-set tolerance. In this way, CP protection can be monitored continuously rather than manually on a bi-monthly basis by employees under the current mandated periodic inspection program.

This budget code also was created to track projects specifically dedicated to other specialty CP system work including, improvement surveys above and beyond the typical activities in budget code 509 such as renewals of magnesium anode bags, and remediation of CP isolated services and steel risers on distribution pipelines. This effort to continually provide CP system enhancements is an ongoing long-term effort.

Cathodic protection equipment and facilities are required to achieve and maintain corrosion control on wrapped steel gas-carrying pipelines and components as required under 49 CFR 192 Subpart I, and CPUC GO 112-F. Cathodic protection extends the steel pipeline system life. For additional details on the function of basic cathodic protection, please see the description of budget code 509.

Cathodic Protection system enhancements mitigate safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-46 below provides the RAMP activities and their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (12551).

TABLE LPK-46
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – CP System Enhancements (12551) RAMP Activity Capital Forecasts by Workpaper (In 2021 $)					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C12	Cathodic Protection System Enhancements	1,996	1,996	1,996	-

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Expenditures in this work category are associated with the installation of major CP components and equipment for the purpose of separating high-pressure and medium-pressure distribution pipeline CP systems as well as the installation of remote monitoring equipment. This therefore provides for cathodic protection (CP) reliability improvements on the DOT transmission and supply line pipeline systems.

A review of historical expenditures from 2017 through 2021 revealed, other than an increase in work activity in 2018 from one large CP enhancement project, a stable trend in work activity over the past three years. This is expected to continue through the forecast years, therefore budget code 12551 was forecast using a three year average methodology for labor and non-labor as it best represents the required base level of routine work for CP enhancement projects.

The forecasted expenditures based on the three-year average trend for the Cathodic Protection System Enhancement in years 2022, 2023, and 2024, are $1,996,000, $1,996,000, and $1,996,000 respectively.

3. Cost Drivers

As previously discussed, the main driver for Cathodic Protection work is compliance with DOT Regulation 49 C.F.R. § 192, Subpart I, and GO 112-F, which sets forth the minimum standards or regulations for corrosion control as well as the need to safeguard the integrity of the

pipeline system thus mitigating risks associated with infrastructure integrity, system reliability, and public safety.

Expenditures in this area tend to fluctuate depending on the health of surrounding CP stations, soil conditions, and effective resolution of system shorts. As the piping infrastructure continues to age, expenses for municipal requirements, Company labor, contractor services, third-party services, paving services, and materials continue to remain as a cost driver. Furthermore, expenditures in the Cathodic Protection System Enhancement budget code are required as CP station splits, renewals, or CP remediation work is performed. This is necessary to provide an adequate level of cathodic protection to the aging steel pipeline system.

K. System Reliability & Safety (510)

TABLE LPK-47
System Reliability & Safety (510)

GAS DISTRIBUTION (In 2021 $)				
K. System Reliability & Safety	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. System Reliability & Improvements	645	1,956	3,456	1,956
Total	**645**	**1,956**	**3,456**	**1,956**

1. Description

The System Reliability and Safety budget code provides funding for capital projects (not captured under other budget codes) that improve safety, provide required code compliance, and improve gas system performance or reliability through the replacement of aging gas pipeline system operating equipment. Projects completed under this budget code typically involve upgrades to distribution fittings, valves, regulator stations, relocating regulator stations out of traffic due to growth, and other safety improvements to gas distribution facilities.

Regulator Stations are critical components of control equipment on the SDG&E pipeline network that support the mitigation of risks associated with infrastructure integrity, system reliability, and public safety. Regulator stations, consisting of valves and regulators, reduce and control the pressure of the gas entering the distribution system from higher pressure pipelines to provide the lower pressures required on the distribution pipeline network. Failure of a regulator station could over-pressure or shut down the gas distribution system which may impact customer

service and/or public safety. SDG&E currently operates and maintains approximately 491 regulator stations and installs or replaces approximately three to five stations annually. These forecasted capital expenditures support the Company's goals of maintaining the safety, integrity, and reliability of the gas distribution system.

a. RAMP Activities

There is one activity within this work group that is a RAMP mitigation measure supporting the mitigation of safety risk: the Regulator Station Replacement Program. SDG&E will continue its current practice of replacing deteriorating stations with funding from this budget code before operations and safety issues arise. Presently 71% of our operating regulator stations are 24 years or older. The average age of a distribution regulator station is 32 years. This aging will translate into increased replacement expense over future years.

Table LPK-48 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on this RAMP activity, please refer to my workpaper SDG&E-04-CWP (510).

TABLE LPK-48
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – System Reliability & Safety (510) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C05	Reg Station Replacement Program	1,956	1,956	1,956	-

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Spending in this budget category fluctuates from year to year due to the variation in the number, complexity, and timing of identified aging regulator stations and required system component improvement projects. Given the aging of regulator stations and system components, it is anticipated that the general spending trend observed from 2017 through 2021 will continue in the GRC forecast period of 2022 to 2024. Furthermore, the timing of individual projects is based on several factors including the need for review of operating conditions, detailed planning

requirements, acquiring the required permits, risk assessment, and coordination and scheduling of resources. To account for the variation and complexity of projects and associated costs and the continuing need for system equipment renewals, a five-year average of recorded expenditures methodology for the years 2017 through 2021 was selected to forecast base costs in years 2022 to 2024. The forecasted base level expenditures based on a five-year average for the System Reliability and Safety budget code in years 2022, 2023, and TY 2024 is estimated to be $1,956,000, $1,956,000, and $1,956,000 respectively.

In addition, added to this five-year average base level forecast is an incremental addition necessary to improve the safety and reliability of the gas distribution system. This incremental addition is described below:

San Diego (Coronado) Bay Crossing Remediation Project – SDG&E's 6" Line 49-132-G and 8" Line 49-132-H are two high pressure gas distribution pipelines that cross the San Diego Bay in between Seaport Village and Coronado Island. SDG&E standards require a minimum of 24" of cover over their pipelines. Recent sonar surveys completed by SDG&E have identified several locations with inadequate cover along sections of each pipeline in the bay. SDG&E plans to remediate the diminishing cover by installing either additional rock and/or revetment mats over the pipelines at specified locations. Forecasted expenditures for this addition in years 2022, 2023, and 2024 are $0, $1,500,000, and $0, respectively.

3. Cost Drivers

Work activities within the System Reliability & Safety budget category are driven by regulatory requirements as well as the need to safeguard the safety and integrity of the pipeline system and mitigate risks associated with infrastructure integrity, system reliability, and the safety of employees and the public.

The underlying cost driver for this capital work category relates to Company labor, contractor services, third-party services, paving services, and materials such as controls, electronics, valves, pipe, and fittings. In addition, regulator stations are part of SDG&E's aging infrastructure. Presently 71% of SDG&E's operating regulator stations are 24 years or older. The average age of a distribution regulator station is 32 years. This aging will translate into increased replacement expense over future years. All or a combination of these construction elements are necessary for performing regulator station improvements.

L. Underperforming Steel Replacement Program – Thread Main (Pre-1934 Vintage) (19565)

TABLE LPK-49
Underperforming Steel Replacement Program – Threaded Main (Pre-1934 Vintage)

GAS DISTRIBUTION (In 2021 $)				
L. Underperforming Steel Replacement Program – Threaded Main (Pre-1934 Vintage)	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Underperforming Steel Replacement Program – Threaded Main (Pre-1934 Vintage)	13,682	7,000	7,000	7,000
Total	**13,682**	**7,000**	**7,000**	**7,000**

1. Description

This all RAMP Underperforming Steel Replacement Program mitigates risk on early vintage steel and underperforming CP protected steel pipelines that were installed using construction practices that are no longer considered best practices. This pipe is replaced with state of the art (SOTA) pipe using industry best practices and current regulations. Along with the installation of SOTA pipe, this activity would include safety mitigations such as warning mesh over the pipe and excess flow valves on services. The determination of where and when to implement mitigation measures is based on pipe attributes, operational conditions, and potential impacts on populations in the event of an incident. The Underperforming Steel Replacement Program proactively identifies the risk factors for remediation before operational and safety issues arise.

Prior to 1934, piping in the gas distribution system was joined by threaded couplings. This project aims to proactively remove a total of 165 miles of threaded main pipe over a multi-year period as well as associated services (it is estimated this also involves 218 miles of services). It is anticipated that pipe replacement mileage can vary slightly from year-to-year.

Threaded pipe has a greater susceptibility to leaks at the joint connections and higher potential for joint failure during a seismic event. This is due to the thinning of the wall thickness from the cutting of the threads into the pipe.

This program mitigates the potential for gas leakage due to the replacement of vintage threaded steel mains and services. The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-50 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (19565).

TABLE LPK-50
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Underperforming Steel Replacement Program - Threaded (Pre-1934 Vintage) (19565) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C8-T1	Underperforming Steel Replacement Program - Threaded (Pre-1934 Vintage)	7,000	7,000	7,000	0.2

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

This forecast is based on the goal of removing approximately 165 miles of early vintage medium-pressure steel pipelines over a multi-year period, the targeted mileage to be removed can vary slightly from year-to-year. Based on the annual removal target, the forecasted mileage is then multiplied by an estimated cost per mile to get the annual forecast.

Due to the limited historical data available, a zero-base forecast methodology was selected. This forecast is based on the 165 miles of pre-1934 and earlier vintage pipe that needs to be replaced over the life of this program.

The projected expenditures for budget code 19565 for 2022, 2023, and 2024 are $7,000,000, $7,000,000, and $7,000,000, respectively. For additional details refer to Ex. SDG&E-04-CWP (19565).

3. Cost Drivers

The underlying cost driver for this capital work category relate to increased municipal requirements, Company labor, contractor services, third-party services, paving services, and

materials such as valves, pipe and fittings and asbestos abatement. All or a combination of these construction elements are necessary for pipe replacement.

M. Underperforming Steel Replacement Program – 1934-1965 Vintage (19564)

TABLE LPK-51
Underperforming Steel Replacement Program – 1934-1965 Vintage

GAS DISTRIBUTION (In 2021 $)				
M. Underperforming Steel Replacement Program (1934-1965 Vintage)	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Underperforming Steel Replacement Program (1934-1965 Vintage)	14,712	3,000	3,000	3,000
Total	**14,712**	**3,000**	**3,000**	**3,000**

1. Description

This all RAMP Underperforming Steel Replacement Program focuses on the replacement of poor performing steel pipe. In early vintage steel mains, coal-tar asphaltic wrap was used as the first layer of corrosion protection. Over time, this early generation pipe wrap degrades and disbonds from the pipe, causing any cathodic protection current to leave the pipe around the disbonded coating thereby not providing adequate cathodic protection. Ultimately, this lack of corrosion protection will lead to increased leakage. SDG&E anticipates continuing this program while monitoring performance thereby continually reviewing the benefits and risk reduction accomplished. Examples of Early Vintage Steel Replacement indicators include but are not limited to steel pipe leak repairs and incident leak rates, coating type and condition, historical CP protection, population density, pipe diameter, any active reported leak codes in the segment, and CP area performance. This pipe is replaced with state of the art (SOTA) pipe using industry best practices and current regulations. Along with the installation of SOTA pipe, this activity would include safety mitigations such as warning mesh over the pipe and excess flow valves on the services.

The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-52 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (19564).

TABLE LPK-52
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Underperforming Steel Replacement Program – 1934-1965 Vintage (19564) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C08-T2	Underperforming Steel Replacement Program (1934-1965 Vintage)	3,000	3,000	3,000	0.2

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

SDG&E plans to proactively remove poorly performing early vintage steel pipe. Ultimately, pipe replacement is dependent on monitoring overall pipeline performance for the years 1934-1965. This program proactively prioritizes the replacement of early vintage steel pipe based on monitoring performance thereby continually reviewing the benefits and risk reduction accomplished. Determination of what constitutes poorly performing pipe is dependent on the analysis of the indicators discussed in the description above.

Due to the limited historical data available, a zero-base forecast methodology was selected. Based on the annual removal target, the forecasted mileage is multiplied by an estimated cost per mile to get the annual forecast.

The projected expenditures for underperforming steel replacement for 2022, 2023, and 2024 are $3,000,000, $3,000,000, and $3,000,000 respectively. For additional details refer to Ex. SDG&E-04-CWP (19564).

3. Cost Drivers

The underlying cost drivers for this capital work category relate to municipal requirements, Company labor, contractor services, third-party services, paving services, and materials such as valves, pipe and fittings and asbestos abatement. All or a combination of these construction elements are necessary for pipe replacement.

N. Underperforming Steel Replacement Program – Other Steel (Post 1965 vintage) (514)

TABLE LPK-53
Underperforming Steel Replacement Program – Other Steel (Post 1965 vintage)

GAS DISTRIBUTION (In 2021 $)				
N. Underperforming Steel Replacement Program – Other (Post-1965 Vintage)	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Underperforming Steel Replacement Program – Other (Post 1965 Vintage)	4,207	3,001	3,001	3,001
Total	**4,207**	**3,001**	**3,001**	**3,001**

1. Description

This Underperforming Steel Replacement Program is all RAMP. SDG&E currently replaces underperforming steel pipe based on an analysis that prioritizes pipe replacement. The process for selecting pipelines requiring replacement considers various replacement indicators. These indicators include, but are not limited to, steel pipe leak repairs and incident leak rates, coating type and condition, historical CP protection, population density, pipe diameter, any reported active leak codes in the segment, and CP area performance. This pipe is replaced with state of the art (SOTA) pipe using industry best practices and current regulations. Along with the installation of SOTA pipe, this activity would include safety mitigations such as warning mesh over the pipe and excess flow valves on each of the services.

These planned pipeline replacements processed in this manner will therefore result in identifying pipeline replacement candidates in priority order. Pipeline replacements can then be planned, with strong emphasis on removing pipelines with a recurring leak history. Identifying these pipeline replacement candidates, in priority order, will be used in this budget code for replacement funding decisions resulting in removal of the highest priority risks to the public.

The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-54 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (514).

TABLE LPK-54
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Underperforming Steel Replacement Program - Other (Post-1965 Vintage) (514)
RAMP Activity Capital Forecasts by Workpaper (In 2021 $)

RAMP ID	Description	2022 Estimated RAMP Total (000s)	2023 Estimated RAMP Total (000s)	2024 Estimated RAMP Total (000s)	GRC RSE*
SDG&E-Risk-9 - C08-T3	Underperforming Steel Replacement Program - Other (Post 1965 Vintage)	3,001	3,001	3,001	1

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Due to the limited historical data available, a zero-base forecast methodology was selected. The pipeline or pipeline segment replacement candidates in priority order (discussed in the section above) is used to determine an annual removal target. Based on the annual removal target, the forecasted mileage is multiplied by an estimated cost per mile to get the annual forecast.

The projected expenditures for underperforming steel replacement for 2022, 2023, and 2024 are $3,001,000, $3,001,000, and $3,001,000 respectively. For additional details refer to Ex. SDG&E-04-CWP (514).

3. Cost Drivers

The underlying cost driver for this capital work category relate to municipal requirements, Company labor, contractor services, third-party services, paving services, and materials such as valves, pipe and fittings, and asbestos abatement. All or a combination of these construction elements are necessary for pipe replacement.

O. Early Vintage Program (Components) – Dresser Mechanical Coupling Removal (19566)

TABLE LPK-55
Early Vintage Program (Components) – Dresser Mechanical Coupling Removal

GAS DISTRIBUTION (In 2021 $)				
O. Early Vintage Program (Components) – Dresser Mechanical Coupling Removal	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Early Vintage Program (Components) – Dresser Mechanical Coupling Removal	3,934	2,000	2,000	2,000
Total	**3,934**	**2,000**	**2,000**	**2,000**

1. Description

This Early Vintage Component Program is all RAMP. In the 1920-1930s era, Dresser mechanical couplings were utilized instead of welding on a mixture of distribution and supply lines throughout the San Diego service territory. The Dresser mechanical coupling joins two sections of pipe together without the need for welding. This type of coupling cannot resist lateral movement, and over time the rubber pressure containing seal degrades. Dresser mechanical couplings require lateral support and are not as strong as modern mechanical couplings which have rubber mechanical seals. In the event of land movement, pipe separation and/or rupture may occur and create an incident. These types of incidents occur at a low frequency, but have potentially high consequence events because the Dresser mechanical couplings are primarily located in high population density areas. They exist in both the medium and high-pressure gas distribution systems. This project consists of evaluating locations where Dresser mechanical couplings exist, then excavating and removing the Dresser mechanical couplings. Following the removal, the pipe segments will be rejoined using modern welding practices. This mitigates the risk of an incident caused by the leakage of gas from these couplings.

The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-56 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (19566).

TABLE LPK-56
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Early Vintage Program (Components) – Dresser Mech Coupling Removal (19566)
RAMP Activity Capital Forecasts by Workpaper (In 2021 $)

RAMP ID	Description	2022 Estimated RAMP Total (000s)	2023 Estimated RAMP Total (000s)	2024 Estimated RAMP Total (000s)	GRC RSE*
SDG&E-Risk-9 - C09-T2	Early Vintage Program (Components) – Dresser Mech Coupling Removal	2,000	2,000	2,000	1

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Due to the limited historical data available, a zero-base forecast methodology was developed. This forecast is based on the estimated 85 known Dresser mechanical couplings that need to be removed or encapsulated in the San Diego service territory. Based on the annual removal target, the forecasted number of Dresser mechanical coupling removals is multiplied by an estimated cost per removal to get the annual forecast.

Anticipated expenditures for the Dresser mechanical coupling removal effort for the years 2022, 2023, and 2024 are expected to be $2,000,000, $2,000,000, and $2,000,000, respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

The underlying cost driver for this capital work category relate to municipal requirements, Company labor, contractor services, third-party services, paving services, and materials such as valves, pipe and fittings and asbestos abatement. All or a combination of these construction elements are necessary for Dresser coupling removals.

P. Early Vintage Program (Components) – Oil Drip Piping Removal (19567)

TABLE LPK-57
Early Vintage Program (Components) – Oil Drip Piping Removal (19567)

GAS DISTRIBUTION (In 2021 $)				
P. Early Vintage Program (Components) – Oil Drip Piping Removal	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Early Vintage Program (Components) – Oil Drip Piping Removal	3,668	1,500	1,500	1,500
Total	**3,668**	**1,500**	**1,500**	**1,500**

1. Description

The Early Vintage Component Programs are all RAMP. Early Vintage Program (Components) – Pipeline oil drips were installed in low point high volume areas of the gas system to collect and purge unwanted liquids from gas mains. These systems were installed in the early days in the downtown areas when coal gasification was used and liquids were traditionally found in the gas system. Since liquids are no longer an issue for the SDG&E pipeline system, oil drips are obsolete. The buried oil drip piping facilities are at risk of excavation damage as their location and configuration historically were not captured with enough detail to identify them with precision on facility maps. These facilities often were symbolized by a "teardrop" on the maps. Because the feature lengths and attributes were not mapped in detail, it has led to difficulties in marking out as part of locate and mark requests. In recent history, a facility was damaged and caused an uncontrollable release of gas until the pipeline could be shut down.

Gas Distribution has gathered historical oil drip location data and marked the approximate location of these facilities in GIS; however, this effort needs additional validation. This project will analyze results from the work orders reviewed and field validation of above ground and buried oil drip lines and containers. Additionally, funding from this budget code will be used to validated oil drip line and oil drip container locations. The ones that are no longer necessary will be removed from the system thus improving the safety and reliability of the system.

The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-58 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (19567).

TABLE LPK-58
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Early Vintage Program (Components) – Oil Drip Piping Removal **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C09-T1	Early Vintage Program (Components) – Oil Drip Piping Removal	1,500	1,500	1,500	10

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Due to the limited historical data available, a zero-base forecast methodology was selected. It is estimated that approximately 36 oil drip lines and/or associated containers that are no longer necessary will be removed from the system thus improving the safety and reliability of the system as identified in the RAMP Report. Based on the annual removal target, the forecasted number of oil drip removals is multiplied by an estimated cost per removal to get the annual forecast.

Anticipated expenditures for the oil drip removal effort for the years 2022, 2023, and 2024 are expected to be $1,500,000, $1,500,000, and $1,500,000, respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

The underlying cost driver for this capital work category relate to municipal requirements, Company labor, contractor services, third-party services, paving services, and materials such as valves, pipe and fittings and asbestos abatement. All or a combination of these construction elements are necessary for oil drip removals.

Q. Early Vintage Program (Components) – Removal of Closed Valves between High/Medium Pressure Zones (19569)

TABLE LPK-59
Early Vintage Program (Components) – Removal of Closed Valves between High/Medium Pressure Zones (19569)

GAS DISTRIBUTION (In 2021 $)				
Q. Early Vintage Program (Components) – Removal of Closed Valves between High/Medium Pressure Zones	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Early Vintage Program (Components) – Removal of Closed Valves between High/Medium Pressure Zones	893	1,500	1,500	1,500
Total	**893**	**1,500**	**1,500**	**1,500**

1. Description

This Early Vintage Component Program is all RAMP. SDG&E has identified approximately 35 valves which separate high-pressure from medium-pressure systems. These valves are permanently locked out and tagged out, in the closed position, to serve as a physical barrier between high pressure and medium pressure pipelines. This condition is typically a result of an MAOP uprate of a pipeline which was previously interconnected to a distribution system and operated at a lower MAOP. Simply closing and locking the valve between high-and medium pressure systems is no longer an acceptable practice as there is inherent risk should the valve be operated in error, operated in an act of sabotage, or the valve leaks pressure downstream to the lower MAOP system potentially causing an overpressure condition of the downstream system.

This project will verify valve locations in the field, excavate, and remove the closed and locked valves currently connecting high-pressure piping to medium pressure piping thus improving the safety and reliability of the system.

The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK60 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (19569).

TABLE LPK-60
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Early Vintage Program (Components) – Remove Closed Valves between HP/MP Zones (19569) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C09-T3	Early Vintage Program (Components) – Remove Closed Valves between HP/MP Zones	1,500	1,500	1,500	1

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Due to the limited historical data available, a zero-base forecast methodology was selected. SDG&E has identified approximately 35 valves in the closed position, which separate high-pressure from medium-pressure systems, that need to be removed from the SDG&E service territory. Based on the annual removal target, the forecasted number of valve removals is multiplied by an estimated cost per removal to get the annual forecast. Anticipated expenditures for the removal of Closed Valves between High/Medium Pressure Zone for the years 2022, 2023, and 2024 are $1,500,000, $1,500,000, and $1,500,000, respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

The underlying cost driver for this capital work category relates to Company labor, Municipal requirements, contractor services, third-party services, paving services, and materials such as valves, pipe, and fittings. All or a combination of these construction elements are necessary for performing high pressure to medium pressure valve replacements.

R. Piping in Vaults Replacement Program (19568)

TABLE LPK-61
Piping in Vaults Replacement Program (19568)

GAS DISTRIBUTION (In 2021 $)				
R. Piping in Vaults Replacement Program	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Piping in Vaults Replacement Program	2,925	1,500	1,500	1,500
Total	**2,925**	**1,500**	**1,500**	**1,500**

1. Description

This all RAMP project is for the replacement of piping located in underground vaults. SDG&E has a number of locations where piping and valves are surrounded by a concrete vault to provide access to the valve for emergency operations. Any pipe segment, fitting, or valve exposed within a below grade vault is at risk for accelerated atmospheric corrosion due to the potential for water accumulation, pipe coating failure, and decreased cathodic protection. Decreased CP protection effectiveness occurs as these components within the vault are not protected for buried conditions and are exposed to the atmosphere.

This on-going activity follows the review of existing work orders determining the locations of all vaults containing medium and high-pressure facilities. Once a vault with exposed valves and piping is fielded and identified, the valve(s) and piping will be replaced and the vault removed and backfilled so that the new buried facilities will be cathodically protected. There are approximately 350 locations that SDG&E will assess the coating and the condition of the facilities within the vaults and prioritize them for replacement.

The program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-62 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (19568).

TABLE LPK-62
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Piping in Vaults Replacement Program (19568) RAMP Activity Capital Forecasts by Workpaper (In 2021 $)					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C03	Piping in Vaults Replacement Program	1,500	1,500	1,500	3

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Due to the limited historical data available, a zero-base forecast methodology was developed. Following the review of approximately 1,850 work orders, it was determined that there are approximately 350 locations that SDG&E will assess and prioritize for potential replacement. Based on the annual removal target, the forecasted number of piping in vault project removals is multiplied by an estimated cost per removal to get the annual forecast.

Anticipated expenditures for the Piping in Vaults Replacement Program for the years 2022, 2023, and 2024 are, $1,500,000, $1,500,000, and $1,500,000, respectively. For additional details refer to Ex. SDG&E-04-CWP (19568).

3. Cost Drivers

The underlying cost driver for this capital work category relate to municipal requirements, Company labor, contractor services, third-party services, paving services, and materials such as valves, pipe and fittings and asbestos abatement. All or a combination of these construction elements are necessary for performing piping in vault replacements.

S. Control Center Modernization (CCM) Project (21574)

TABLE LPK-63
Control Center Modernization (CCM) Project (21574)

GAS DISTRIBUTION (In 2021 $)				
T. Control Center Modernization (CCM) Project	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Control Center Modernization (CCM) Project	0	449	3,235	4,080
Total	**0**	**449**	**3,235**	**4,080**

1. Description

The Control Center Modernization (CCM) project is an all RAMP mitigation activity. This project will enhance distribution field assets by installing control and real time pressure monitoring capabilities.[50] Increased operational awareness through the implementation of a centralized data management system and real time monitoring capabilities will help Gas Control personnel to quickly identify abnormal operating pressures within the system and will provide them with remote control functionality to help prevent an overpressure. With the introduction of these new field assets and capabilities, the CCM project will introduce new processes, training, and increase workforce. Additionally, these field assets will be supported by the implementation of new control room, operations technology (OT) system, and network technologies. The new control room technology features will focus on employee safety, security, ergonomics, training, and decision making while the CCM OT functionality will integrate both new and existing OT platforms to provide system-wide viewing of daily health and alarm information from the Company's new field pipeline technologies. Operators and region personnel will be able to leverage these new systems and data analytics to troubleshoot issues and/or perform proactive mitigations to prevent abnormal operating conditions. The installation and deployment of these CCM field assets and technology will be on-going through 2028. The specific details regarding the CCM project are in the Gas Transmission Operations and Construction testimony of Messrs. Chiapa, Hruby, and Bell (Ex. SCG-06).

[50] BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest, and most reliable energy infrastructure company in America.

This program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-64 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (21574).

TABLE LPK-64
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – CCM (21574) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C17	CCM Distribution Field Asset Real Time Monitoring and Control Site Installations/Upgrades & New Control Room Technologies	449	3,235	4,080	-

*An RSE was not calculated for this activity. Additional details are available in SDG&E-04-CWP.

2. Forecast Method

The forecast method developed for this cost category is zero based. A zero-base forecast was used due to insufficient historical costs to adequately reflect the full deployment schedule from 2022 through 2024. Annual costs were developed using the forecasted number of units to be installed, replaced, or enhanced each year multiplied by the cost per unit values. This was done for each of three major components of the project, each of which had a slightly different goal to achieve for that project component. Forecast cost details for these major components are described more fully in my workpapers, SDG&E-04-CWP (21574) for additional details on development of the zero-based costs for these major project components along with resulting total costs, please refer to the workpapers of Messrs. Chiapa, Bell and Hruby, joint witnesses for Gas Transmission Operations and Construction (SCG-06-CWP).

Anticipated expenditures for the CCM Project in years 2022, 2023, and 2024 are, $449,000, $3,235,000, and $4,080,000, respectively. For additional details refer to Ex. SDG&E-04-CWP (21574).

3. Cost Drivers

The underlying cost driver for this capital work category relates to Company labor, contractor services, third-party services, paving services, and materials such as controls, electronics, valves, pipe, and fittings. All or a combination of these construction elements are necessary for the design, development, and deployment of the CCM Modernization Project.

T. Curb Valve Replacement (21575)

TABLE LPK-65
Curb Valve Replacement (21575)

GAS DISTRIBUTION (In 2021 $)				
U. Curb Valve Replacement	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Curb Valve Replacement	0	1,000	1,750	1,750
Total	**0**	**1,000**	**1,750**	**1,750**

1. Description

The all RAMP budget code covers costs associated with Curb Valve Replacements. All newly installed or replaced service lines with installed meter capacity exceeding 1000 standard cubic feet per hour (SCFH), must have installed either a manual service line shut-off valve (a "curb" valve or other manually operated valve) or an excess flow valve (EFV)[51]. This mitigation project will survey the gas system for installed curb valves, prioritize their replacement based on inaccessibility issues and schedule the replacement of these valves with EFVs.

In the past, if a curb valve was chosen, requirements for these manually operated valves from 49 CFR 192.385, include that they "be located near the service that is safely accessible to operator personnel or other personnel authorized to manually shut off gas flow to the service line, if needed." In addition, if a manual curb valve was chosen to comply with the service line shut off requirement, 49 CFR 192.385 also requires that it must be "installed in such a way to allow accessibility during emergencies." "...[they are]..subject to regular scheduled

[51] *See* 49 CFR § 192.385 – Manual service line shut-off valve installation.

maintenance." If an EFV was chosen as the shut off device, it is buried as near as practical to the service to main connection. The EFV has an advantage over a curb valve (which requires periodic inspection and maintenance) in that it is designed to automatically shut off the service if a high flow is detected (such as that associated with a broken service line).

When there is a broken service line incident, based on the location requirements discussed above, the EFV (with automatic response) will protect the majority of the service line to the customer as opposed to the curb valve (requiring manual operation) located closer to the customers property will protect only a smaller portion of the service line. The EFV also does not have the location accessibility constraints that manually operated curb valves have in order to be operated.

Prior to the mandate to install EFVs on services, manually operated curb valves were installed on services, for various reasons, to remotely shut off a service line. Some of these valves, accessible from inside a curb valve box, may still be inaccessible due to their location in a parking strip where they could be covered with a parked vehicle, or located within high traffic areas. In addition, these curb valve boxes, which have not required inspection in the past, may have filled with street sand, or have been covered with street paving or sidewalk construction limiting access to the valve.

Because EFVs are automated and do not require manual operation, the response time to shut off a curb valve is much longer than the auto-shut off response time of an EFV. In addition, EFVs are not subject to street and sidewalk location inaccessibility issues. This will significantly mitigate risk to the public and the affected customer by decreasing the response time to shut down a customer service, when required, due to damage of the service line from outside forces.

This program mitigates safety risks identified in the 2021 RAMP Report. Accordingly, this budget code in its entirety, aligns with a RAMP activity.

Table LPK-66 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (21575).

TABLE LPK-66
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Curb Valve Replacements with EFV's (21575) RAMP Activity Capital Forecasts by Workpaper (In 2021 $)					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - M03	Replace Curb Valves with EFVs	1,000	1,750	1,750	11

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Due to the limited historical data available, a zero-base forecast methodology was developed. Based on the annual removal target, the forecasted number of curb valve replacements is multiplied by an estimated cost per replacement to get the annual forecast.

The forecasted expenditures for this budget code in years 2022, 2023, and 2024 are, $1,000,000, $1,750,000, and $1,750,000, respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

The underlying cost driver for this capital work category relate to Company labor, contractor services, third-party services, paving services, and materials such as excess flow valves, pipe, and fittings. All or a combination of these construction elements are necessary for curb valve replacements.

U. CNG Station Upgrades (14553)

TABLE LPK-67
CNG Station Upgrades (14553)

GAS DISTRIBUTION (In 2021 $)				
V. CNG Station Upgrades	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. CNG Station Upgrades	0	137	137	137
Total	**0**	**137**	**137**	**137**

1. Description

This budget code provides funds for upgrades or installations of company public access CNG stations. SDG&E does not plan to install any new CNG stations but plans to continue the maintenance of existing public access CNG fill stations.

Company owned public access CNG stations serve the existing customer base of CNG vehicles throughout Southern California in the private, business, and industrial sectors. These stations are used by private vehicle owners, the City of San Diego refuse trucks, military base vehicles, University of California San Diego buses, and companies such as Red Bull, Republic Services, and several taxi companies.

2. Forecast Method

Spending in this budget category will consist of small facility capital upgrades needed to maintain the CNG station's serviceability to the public. The historical average over the years 2017-2021 was analyzed to determine the expenses necessary to provide small facility upgrades. In the historical analysis it was seen that some years had zero spend while other years there could be significant spend. To capture both the spend and zero spend years, a five-year average forecast methodology was selected. The forecasted expenditure in years 2022, 2023, and 2024 is $137,000, $137,000, $137,000 respectively.

3. Cost Drivers

The underlying cost driver for this capital work category relate to Company labor, contractor services, third-party services, and materials such as compressor components, valves, pressure vessels, pipe, and fittings.

V. Local Engineering Pool (902)

TABLE LPK-68
Local Engineering Pool (902)

GAS DISTRIBUTION (In 2021 $)				
W. Local Engineering Pool	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Local Engineering Pool	23,764	22,990	25,112	24,574
Total	**23,764**	**22,990**	**25,112**	**24,574**

1. Description

The Local Engineering Pool work category provides the labor and non-labor funding for a broad range of services to support Gas Distribution field capital asset construction. This budget code represents the forecasted costs associated with the Gas Distribution Local Engineering Pool. Certain costs are incurred by capital projects that originate from central activities which are subsequently distributed to those capital projects. These central activity costs are also called "pooled" or "indirect" costs. The distribution of these costs is based on a number of factors such as Company labor, contracted services, and applicant installations. The mechanics of the distribution of indirect costs to project direct costs, resulting in total project costs, is addressed by Mr. Paul Malin (Ex. SDG&E-34).

The Local Engineering Pool is composed of three cost categories: technical planning, project management, and engineering activities.

Technical Planning and Project Management – Technical planning refers to all activities that take place in the region technical and project management office in support of capital projects. These support work activities include, but are not limited to, the following:

- Planning the Project – This includes conducting field visits to assess job site requirements; retrieving available drawings for the proposed site to determine construction options; coordination with customers, municipalities, and government agencies; selecting material, job specifications, and method of installation; developing traffic control procedures and obtaining the required permits.
- Producing Project Drawings – This includes completing drawings required to obtain construction permits that are used by SDG&E and contractor field crews for asset installation and documenting the project in SDG&E records. It also includes updating drawing information following project completion necessary for documenting accurate records in SDG&E's electronic and physical archives.
- Acquiring and Managing Third Party Services – Construction oversight for acquiring third-party services such as paving, steel plates and equipment. This is necessary to provide oversight of third-party services to maintain compliance with Company specifications.
- Estimating Work Order Cost – This includes providing work order cost estimates and cost analysis for each capital project.
- Program Management Office (PMO) – activities which include program strategy, project controls during the project life cycle, regulatory reporting, and Gas Distribution's finance, budgeting, accounting functions, and analysis and

implementation of operational continuous improvement.[52] PMO activities also include communicating progress to various stakeholders.

Engineering Activities – Included in this pool's expenditures are the activities performed by local engineering personnel to support capital projects. Examples of those activities include but are not limited to, gas network analysis, the review and development of construction designs, pressure control specifications, gas handling plans, identification of regulatory and code requirements, and conduct assessments of construction impacts on the reliability of the gas distribution system.

Adequate funding for personnel charging time to the Local Engineering budget code is critical to the execution of capital projects. To prepare a project for field construction, personnel charging this work category initiate, plan, design, and schedule the project for field construction.

Once the job is in construction, field management oversees the crews and is responsible for making field decisions that are compliant with Company standards and policies. After the project has been constructed, there is the remaining task of reconciling the construction as-built information, which also involves the personnel charging to this work category. These forecasted capital expenditures support the Company's goals of promoting sustainability, safety, and reliability of the natural gas system.

a. RAMP Activities

The RAMP activities in this work group which are mitigation measures supporting safety risks are Gas Handling Plans, the GGIS group, and GGIS Growth. These activities are described below:

Gas Handling Plans[53] – Responding to recommendations from the National Transportation Safety Board (NTSB), SDG&E developed a process called a gas handling plan (GHP) and required a GHP be created as part of the design process for all high-pressure mains and mains operating at or less than 60 psig and services using any fitting larger than a 2" service tee at the service-to-main connection. The GHP is a site-specific document with detailed

[52] BBB is an ongoing business optimization and continuous improvement initiative at SDG&E, undertaken to support our mission to improve lives and communities by building the cleanest, safest, and most reliable energy infrastructure company in America.

[53] A.21-05-011, SDG&E's 2021 RAMP Report SDG&E-Risk-9 Incident Related to the Medium Pressure System (Excluding Dig-in).

procedures and graphical flow depictions describing the step-by-step processes, to "handle" the diversion of gas flow internal to the piping system. The GHP is developed, reviewed, and signed by design, engineering, and construction supervisory personnel. A GHP provided for the applicable gas system pipeline construction projects can reduce the risk of an incident occurring due to a miscommunication or human error.

GGIS Records Management – This item, discussed in the 2021 RAMP Report is tied to the CFF- Records management.[54] The GGIS department in Gas Distribution is key in maintaining compliance, helping with damage prevention, and assisting with fugitive emissions. These activities support SDG&E's goal of providing resilient, safe, and reliable service to all customers.

GGIS Growth – one GIS Technician will be added in the Gas GIS workgroup beginning in 2022 and another in 2023 to support an increase in projects requiring mapping and records work driven by new business activity, pipeline relocations, main extensions, system reinforcement projects, pipeline replacements, main and service maintenance, GO 112-F reporting requirements, and various other operational activities that impact the gas system configuration. GIS is the system of record for Gas Distribution facilities, containing a graphical representation of the facility location and facility attributes.

The continued compliance with GO 112-F requires that:

> At the same time [annually] that copies of reports required by Section 123.1 are submitted, the following information shall be submitted to demonstrate to the Commission and the public and Operator's efforts towards minimizing the risk from system leaks and failures: … the amount of time it takes for changes, repairs, or new facilities to be finalized and updated, per the Operator's procedures, to the Operator's facilities maps segregated into less than 14 days, 14 to 30 days, 30 to 90 days, 90 to 180 days, 180 to 360 days, and more than 360 days.[55]

The addition of GIS Technicians will allow SDG&E to meet the Company's goal of capturing attributes and mapping the facilities or changes within 180 days. The GIS Technicians capture and catalogue up to 30 attributes into a GIS database for each mapped facility. Examples of recorded attributes include pipe diameter, material, installation year, installation work order,

[54] *See* SDG&E's 2021 RAMP Report, SDG&E-CFF-6 Records Management-M01.

[55] GO 112-F, Section 123.1

maximum allowable operating pressure, leak survey cycles, pressure district number, and cathodic protection system attributes.

Table LPK-69 below provides the RAMP activities, their respective cost forecasts for this workpaper. For additional details on these RAMP activities, please refer to my workpaper SDG&E-04-CWP (902).

TABLE LPK-69
RAMP Activities Capital Forecasts by Workpaper
In 2021 Dollars ($000)

GAS DISTRIBUTION – Local Engineering (902) **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**					
RAMP ID	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE***
SDG&E-Risk-9 - C13	Human Factors Mitigations - Gas Handling Plans	294	369	445	-
SDG&E-CFF-6 - New	Gas Geographic Information System (GGIS) Group	1,191	1,191	1,191	-
SDG&E-CFF-6 - New	GGIS Growth	107	204	194	-

*Tranche level RSEs and additional details are available in SDG&E-04-CWP.

2. Forecast Method

Collectively, the level of support activities in the Local Engineering pool can fluctuate with the level of capital construction activity. Generally, the greater the volume of construction activity, the larger the support costs. Because of this relationship, a zero-based forecast was selected by evaluating the Local Engineering pool's historic capital expenditures with respect to the total direct expenditure across all Gas Distribution capital budget codes except for the Gas Meter and Regulators (502) and the Tools and Equipment (506) budget codes. This produced an annual relationship of the percentage of Local Engineering to total direct capital expenditures. The five-year (2017 through 2021) average of this historical ratio was then applied to the forecasted total capital expenditures (less those budget codes discussed above) to determine the 2022, 2023, and TY 2024 forecast for Local Engineering.

In addition, the following incremental activities are also included in this forecast for the 902 budget code:

Night Welding Class – A night welding class will be established to provide preparation instruction as a pre-school for the day welding classes. This portion of the training will charge 70% to Capital, the balance to O&M.

The incremental funding needed over the base forecast for this upward pressure is $53,000 for TY 2024.

Capital Project Management – Three Project Managers will be added as a result of capital project growth starting in 2022. These positions will provide project control leadership for the planning, development, and implementation of large-scale, major strategic projects and portfolio of projects. Effectively collaborate with internal departments, stakeholders, cross-functional teams, and vendors to define requirements, assess alternatives, and present solutions to business challenges. Will also be responsible for budget and resource planning. The incremental funding needed over the base forecast for this upward pressure is $375,000 for TY 2024.

Capital Construction Growth – Two Field Utility Specialists will be added as a result of capital growth starting in 2022. These positions will provide project planning support, produce project drawings, acquire, and manage third-party services, estimate word order costs, complete conflict checks, conduct field visits, and coordinate with customers, municipalities, and government agencies. An additional vehicle requirement will be added to support these additional positions. This incremental vehicle requirement is included in the Fleet Services Testimony of Mr. Alvarez (Ex. SDG&E-22). The incremental funding needed over the base forecast for this upward pressure is $180,000 for TY 2024.

Construction Management Specialist & Advisor – Two construction advisors will be added as a result of capital growth, one Construction Management Specialist starting in 2022 and one Document Control Advisor starting in 2024. The Construction Management Specialist will specialize in construction management. The Document Control Advisor will specialize in advising on document control. Both positions are needed to assist with the documentation of compliance activities of new construction both in the field and the office. The incremental funding needed over the base forecast for this upward pressure is $198,000 for TY 2024.

Engineering Additions – Three Engineers will be added starting in 2022 as a result of capital growth and in support of SDG&E's gas distribution system sustainability goals. These

positions will provide leadership for major or complex engineering and construction projects and studies. They will also provide technical advice, training and guidance to clerical, technical and operating personnel. Additionally, they will drive innovative and creative solutions for business and technical challenges by improving processes, streamlining documentation, and increasing client satisfaction. Two Engineers will support the implementation of 3D M&R facility designs and support CCM monitoring, and control retrofit projects at regulator stations and pressure monitoring sites. One Engineer will support projects on hydrogen blending in natural gas pipeline systems. These positions will charge 90% to Capital, the balance to O&M.

The incremental funding needed over the base forecast for this upward pressure is $344,000 for TY 2024.

GGIS Growth – This RAMP incremental add is described in the RAMP Activities Section above. These positions will charge 77% to Capital, the balance to O&M.

The incremental funding needed over the base forecast for this upward pressure is $194,000 for TY 2024.

QA/Compliance Field Ops and CP QA Inspectors – One Field Ops QA Inspector will be added starting in 2022 to review the work done by the company Gas Field Operations personnel, determining the effectiveness and adequacy of the processes and procedures used in normal operation and maintenance. One CP QA Technical Specialist will be added starting in 2022 to review the work done by the company System Protection personnel, determining the effectiveness and adequacy of the processes and procedures used in normal operation and maintenance and verify training effectiveness. Additional vehicle requirements will be added to support these additional positions. These incremental vehicle requirements are included in the Fleet Services Testimony of Mr. Alvarez, (Ex. SDG&E-22). The incremental funding needed over the base forecast for this upward pressure is $117,000 for TY 2024.

Certified Crane Operator Training – Certified Crane Operator classes will provide the necessary certification for operations personnel to safely operate company owned equipment. There is no incremental funding needed over the base forecast for this upward pressure in TY 2024.

The total forecasted expenditures for these incremental additions in years 2022, 2023, and 2024 are $1,134,000, $1,125,000, and $1,461,000 respectively.

Forecasted Local Engineering base level of expenditures, including embedded RAMP activities, necessary to support routine capital work in years 2022, 2023, and 2024 are $21,856,000, $23,987,000, and $23,113,000, respectively.

The total forecasted expenditures for (BC 902), including incremental additions, in 2022, 2023, and 2024 are $22,990,000, $25,112,000, and $24,574,000, respectively. For additional details refer to SDG&E-04-CWP (902).

3. Cost Drivers

As discussed above, collectively, the level of support activities for field capital support can fluctuate with the level of capital construction activity. Generally, the greater the volume of construction activity, the larger the support costs. The underlying cost drivers for this capital budget relate to the necessary capital project support personnel contributing to capital construction. Given this relationship, the cost drivers impacting construction in other Gas Distribution budget codes, as described in the capital section in this testimony, will also impact the Local Engineering pool.

W. Gas Distribution Over Head Pool (905)

TABLE LPK-70
Gas Distribution Overhead Pool (905)

GAS DISTRIBUTION (In 2021 $)				
X. Gas Distribution Overhead Pool	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Gas Distribution Overhead Pool	8,097	5,342	5,695	5,893
Total	**8,097**	**5,342**	**5,695**	**5,893**

1. Description

This budget provides funding for Department Overheads. Costs included in this budget are for supervision and administration of crews in the SDG&E Construction and Operation (C&O) districts. Department Overhead is charged for expenses that are not attributable to one project, but benefit many projects, or the C&O districts. Construction managers, construction supervisors, dispatchers, operations assistants, and other clerical C&O employees charge this account. Construction field employees charge this account when meeting on multiple projects. The non-labor piece consists of administrative expenses such as: office supplies, telephone

expenses, mileage, employee uniforms, and professional dues. This pool includes the costs that will be allocated to distribution gas capital activities. These capital overhead pool forecast values are referenced in the testimony of Mr. Malin (Ex. SDG&E-34, under budget code 905). Typical activities included in this account are:

- Management and supervision of construction personnel; and
- Scheduling, material ordering, and dispatching for construction personnel.

Additional details regarding the Department Overhead Pool (905) budget can be found in the capital workpapers. See SDG&E-04-CWP at section 00905 – Department Overhead Pool.

2. Forecast Method

Collectively, the level of funding for department overheads can fluctuate with the level of capital construction activity. Generally, the greater the volume of construction activity, the larger the support costs. Because of this relationship, a zero-based forecast was selected by evaluating the Department Overhead Pool historic capital expenditures with respect to the total direct expenditure across all applicable Gas Distribution capital budget codes. This produced an annual relationship of the percentage of Department Overhead to total direct capital expenditures. The five-year (2017 through 2021) average of this historical ratio was then applied to the forecasted applicable capital expenditures to determine the 2022, 2023, and TY 2024 forecast for Department Overheads.

The resulting zero-based base forecast for the Department Overhead Pool for 2022, 2023, and 2024 are $5,251,000, $5,404,000, and $5,517,000, respectively.

In addition to the base OH pool forecast, incremental additions were added to the base forecast amounts. These incremental additions are described below:

Instructional Additions – Two Senior Welding Instructors will be added to meet increased O&M and capital demands on welding, welding training, and welding inspection. These positions will also help promote training competencies. These positions will charge 75% of their time to Capital. An additional vehicle requirement will be added to support these additional positions. This incremental vehicle requirement is included in the Fleet Services Testimony of Mr. Alvarez (Ex. SDG&E-22). Forecasted expenditures for this incremental addition in years 2022, 2023, and 2024 are $91,000, $178,000 and $173,000 respectively.

Technical Advisors – One Operator Qualification Compliance Advisor to provide necessary span of control oversight due to the growth in the number of Company and contract

employees requiring compliance with Operator Qualification. In addition, one NDE Program Supervisor to mitigate any compliance issues directly pertaining to the Company's NDE Program. These positions will charge 90% of their time to Capital. An additional vehicle requirement will be added to support these additional positions. This incremental vehicle requirement is included in the Fleet Services Testimony of Mr. Alvarez (Ex. SDG&E-22). Forecasted expenditures for this incremental addition in years 2022, 2023, and 2024 are $0, $113,000, and $203,000 respectively.

The total forecasted expenditures for these incremental additions in years 2022, 2023, and 2024 are $91,000, $291,000, and $376,000 respectively.

The total forecasted expenditures for (BC 905), including incremental additions, in 2022, 2023, and 2024 are $5,342,000, $5,695,000, and $5,893,000, respectively. For additional details refer to SDG&E-04-CWP.

3. Cost Drivers

As discussed above, collectively, the level of support activities for field capital support can fluctuate with the level of capital construction activity. Generally, the greater the volume of construction activity, the larger the support costs. The underlying cost drivers for this capital budget relate to the necessary capital project support personnel contributing to capital construction. Given this relationship, the cost drivers impacting construction in other Gas Distribution budget codes, as described in the capital section in this testimony, will also impact the Gas Distribution Overhead pool.

X. Gas Distribution Contract Administration Pool (906)

TABLE LPK-71
Gas Distribution Contract Administration Pool (906)

GAS DISTRIBUTION (In 2021 $)				
Y. Gas Distribution Contract Administration Pool	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Gas Distribution Contract Administration Pool	8,717	6,466	6,803	6,584
Total	**8,717**	**6,466**	**6,803**	**6,584**

1. Description

This budget provides funding for the Contract Administration (CA) Pool and consists of those expenses necessary for the administration of projects that are performed by contractors at SDG&E. The expenses to this pool consist of labor for Management and Supervision, Contract Administrators (CAs), Field Construction Advisors and support personnel, as well as the associated non-labor support costs such as office and field supplies. This pool includes the costs that will be allocated to contracted work. These capital overhead pool forecast values are referenced in the testimony of Mr. Malin (Ex. SDG&E-34 under budget code 906). Typical activities included in this account are:

- Working with contractors to develop fixed price bids for construction projects;
- Overseeing the contractor work to remove obstacles and verify work is completed and complies with Company standards;
- Approving contractor invoices for completed work; and
- Developing and administering contract units for unit priced contracts.

Additional details regarding the CA Pool budget (906) can be found in the capital workpapers. See SDG&E-04-CWP at section 00906 – Contract Administration (CA) Pool.

2. Forecast Method

Collectively, the level of support activities in the Contract Administration Pool can fluctuate with the level of capital construction activity. Generally, the greater the volume of construction activity, the larger the support costs. Because of this relationship, a zero-based forecast was selected by evaluating the Contract Administration Pool historic capital expenditures with respect to the total direct expenditure across all applicable Gas Distribution

capital budget codes. This produced an annual relationship of the percentage of Contract Administration to total direct capital expenditures. The five-year (2017 through 2021) average of this historical ratio was then applied to the forecasted total capital expenditures (less those budget codes discussed above) to determine the 2022, 2023, and TY 2024 forecast for Contract Administration Pool.

The resulting base forecasts for the Contract Administration Pool for 2022, 2023, and 2024 are $6,466,000, $6,803,000, and $6,254,000, respectively

In addition to the base Contract Administration pool forecast, an incremental addition was added to the base forecast described below:

Capital Construction Growth – Incremental expenses are required for three Field Construction Advisors to be added starting in 2024. These advisors will work with contractors to develop fixed price bids, approve contractor invoices, oversees contractor work, and verify that work is completed and complies with Company standards. An additional vehicle requirement will be added to support these additional positions. This incremental vehicle requirement is included in the Fleet Services Testimony of Mr. Alvarez, (Ex. SDG&E-22). Forecasted expenditures for this incremental addition in years 2022, 2023, and TY 2024 are $0, $0, and $330,000 respectively.

Forecasted Contract Administration pool base level of expenditures, necessary to support routine capital work in years 2022, 2023, and 2024 are $$6,466,000, $6,803,000, and $6,254,000, respectively.

The total forecasted expenditures for (BC 906), including incremental additions, in 2022, 2023, and 2024 are $6,466,000, $6,803,000, and $6,584,000 respectively. For additional details refer to Ex. SDG&E-04-CWP.

3. Cost Drivers

As discussed above, collectively, the level of support activities for field capital support can fluctuate with the level of capital construction activity. Generally, the greater the volume of construction activity, the larger the support costs. The underlying cost drivers for this capital budget relate to the necessary capital project support personnel contributing to capital construction. Given this relationship, the cost drivers impacting construction in other Gas Distribution budget codes, as described in the capital section in this testimony, will also impact the Contract Administration Overhead pool.

Y. Gas Ops Tool Tracker SAP Enhancement (920G)

1. Description

In order to safely maintain gas carrying pipe, fittings, and components, SDGE tracks, repairs, and calibrates tooling used to detect gas and gas leaks, measure gas pressure, determine cathodic protection on underground steel piping, and perform plastic pipe joining. In order to maintain this tooling so that it is functioning within manufacturer specified parameters, tooling information needs to be housed in a system that will store all pertinent tool information including automated features that provide a notification when tooling requires maintenance and calibration. An SAP Tool Tracker system will be needed to efficiently track calibrated tools and maintain compliance.

Capital costs for the forecast years 2022, 2023, and 2024 for IT projects that support, Gas Distribution, are sponsored by Mr. Exon (Ex. SDGE-25, Ch. 2). The purpose of this section of my testimony is to describe the business rationale for these projects. Refer to Mr. Exon's workpapers (Ex. SDGE-25-CWP) for cost details.

VI. MOBILE HOME PROJECT – REASONABLENESS REVIEW

Capital and O&M Mobilehome Park Utility Upgrade (MHP) Program through 2021

TABLE LPK-72

MHP Program (2021 $)	Gas Costs Incurred for MHP Projects Completed through 2021 (000s)	Electric Costs Incurred for MHP Projects Completed through 2021 (000s)	Total (000s)
Capital	93.0	99.2	192.2
O&M	1.7	1.8	3.5
Total	94.8	101.0	195.8

The purpose of this section of my testimony is to establish the reasonableness of $195.8 million ($192.2 million in capital expenditures and $3.5 million in O&M expenditures) incurred during the period January 2017 through December 2021 in executing the Mobilehome Park Utility Upgrade Program (MHP Program). These costs were incurred for activities related to the conversion of MHP Program projects through 2021 pursuant to the MHP Pilot Program Decision (D.) 14-03-021 ("MHP Decision"). Pursuant to D.14-03021, these costs are presented in

SDG&E's General Rate Case (GRC) for reasonableness. These costs are reasonable and justified in that:

- The activities are consistent with the Commission's approved MHP Decision and tariffs, applicable codes and standards established by local, state, and federal authorities and SDG&E's standards;
- The activities enhance the safety and reliability of MHP communities;
- The activities are conducted by qualified employees and contractors; and
- The activities support SDG&E's commitment to enhance public safety and system reliability.

A. Introduction

1. Summary of the MHP Utility Upgrade Program

My testimony (1) describes the activities and reasonableness of costs recorded by SDG&E in executing the MHP Program as directed by the Commission in D.14-03-021 (MHP Decision), and (2) in accordance with Ordering Paragraph (OP) 8 of the MHP Decision, submits as reasonable the costs reported in SDG&E's 2022 MHP Utility Upgrade Program Report.[56] Reasonableness review of costs is limited to recorded costs and excludes any program cost forecasts.

As of December 31, 2021, SDG&E converted 54 MHPs, which is approximately 19% of the eligible mobilehome spaces within SDG&E's service territory. The 54 MHPs represent a combined total of 6,578 permitted spaces.

B. Procedural Background

Rulemaking (R.) 11-02-018 was commenced to "examine what the Commission can and should do to encourage the replacement by direct utility service of the master-meter / submeter systems that supply electricity, natural gas, or both to mobile home parks and manufactured housing communities located within the franchise areas of investor owned electric and/or gas corporations."[57] The rulemaking "grapple[d] with issues that have proven intractable for

[56] *See* SDG&E Mobilehome Utility Upgrade Program, February 1, 2022, Report, appended hereto as Appendix C.

[57] R.11-02-018, Decision Granting Petition in Part and Instituting Rulemaking into Issues Concerning Transfer of Electric and Natural Gas Master-Metered Service at Mobilehome Parks and Manufactured Housing Communities to Direct Service by Electric and/or Natural Gas Corporations (February 25, 2011), at 1.

decades"[58] and, "[a]fter three years of review,"[59] the Commission ordered SDG&E and other investor owned utilities to execute the MHP Program.

The MHP Program was ordered to be a three-year pilot program (2015-2017) to convert master-metered/sub-metered natural gas and/or electric services to direct utility services for approximately ten percent (10%) of spaces in MHPs and manufactured housing communities (collectively, MHPs) in SDG&E's service territory. The focus of the conversions is primarily on safety and secondarily on system reliability/capacity.[60]

On September 28, 2017, Resolution E-4878 authorized the investor-owned utilities ("IOUs") to continue their MHP Pilot Programs through December 31, 2019 ("Pilot Program Extension). SDG&E was authorized to complete the initial 10% scope of eligible spaces and convert up to an additional 5% of eligible spaces, bringing the total scope of the three-year Pilot Program and Pilot Program Extension to 15% of eligible MHP spaces.

On March 18, 2019, the Commission issued Resolution E-4958, authorizing SDG&E to continue its Program for eligible MHPs until the earlier of either December 31, 2021, or the issuance of a Commission Decision for the continuation, expansion, or modification of the program beyond December 31, 2021, in Rulemaking (R.) 18-04-018. Eligible MHPs were defined as those where SDG&E and/or MHP owners had incurred "financial obligations" on or before November 1, 2018. Resolution E-4958 further determined the number of spaces converted in each of years 2020 and 2021 may not exceed 3.33% of the total master-metered spaces in a utility's service territory, excluding MHPs that are already under conversion or scheduled for conversion. It further clarified that if a single MHP upgrade would result in the utility exceeding the 3.33% maximum requirement, the utility is authorized to proceed with that upgrade.

On April 16, 2020, the Commission issued D.20-04-004, approving a ten-year Mobilehome Park Utility Conversion Program beginning in 2021 through 2030. Following a new application period established by the Commission during the 1st quarter of 2020, the

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[58] D.14-03-021 at 3-6. The Commission also discussed efforts commenced in the 1990s to encourage California MHPs with master-metered service to convert to direct utility service, noting that over a period of 17 years little more than two dozen conversions occurred.

[59] *Id.* at 2.

[60] *Id.* at 3.

Commission will provide SDG&E, on an annual basis, with a list of MHPs comprising approximately 3.33% of eligible master-metered spaces within its service territory for a target 50% conversion by the end of 2030. This Decision also recommends a second evaluation of the MHP utility conversion program in 2025 following the first four-year application cycle (2021-2024) to decide whether to continue or modify the program.

On December 23, 2020, the Commission issued a Phase 2 Scoping Memo to further examine ways to protect residents of participating MHPs from unreasonable rent increase or eviction and determine whether the development of an electrification ready service standard for participating MHPs was feasible. On August 20, 2021, the Commission issued D.21-08-025, which adopted consumer protection requirements to keep residents of MHPs that participate in the Commission's MHP Program from experiencing unreasonable rent increases or evictions based on infrastructure improvements funded through the Program. Pursuant to D.21-08-025, SDG&E submitted Advice Letter (AL) 3859-E/3020-G on October 4, 2021, to: (1) update each utility's Sample Forms - Contracts, Mobilehome Park Utility Conversion Program (Program) Agreement (Form 189-1000) to include consumer protection measures for residents of mobilehome parks participating in the Program: and (2) include a description of the specific information that participating MHP owners are to provide to residents, as well as a discussion of methods the mobilehome park owners may use to communicate these protections to their residents. AL 3859-E/3020-G was approved by the Commission as of October 25, 2021.

The MHP Decision ordered those conversions must be completed on a "to the meter" (TTM) and "beyond the meter" (BTM) basis.[61]

Regarding cost recovery for this Commission -mandated safety and reliability program, the Commission stated:

> Utilities will be authorized to fully recover the reasonably incurred, actual costs of the conversion program in distribution rates. Reasonable incremental expenses for program development and administration, not otherwise recovered in rates, should be entered as incurred for annual recovery in the utility's pilot program balancing account. Reasonable expenditures for actual construction costs should be entered as incurred and recovered in the year following cut over to direct utility service. "To the meter" construction costs will be capitalized at the utility's then-current authorized rate of return on rate base, based on actual (not forecast) expenditures. "Beyond the meter" construction costs also will be capitalized

[61] *Id.* at 75 (OP 2).

based on actual (not forecast) expenditures but, consistent with their status as a regulatory asset, will be amortized over ten years at the utility's then-current authorized return on rate base.[62]

The Commission made provisions for program oversight: annual reports that include specific information are required to be filed in the first quarter of every year, and the reasonableness of program costs are to be reviewed by the Commission in an after-the-fact reasonableness review. Specifically, the Commission ordered:

> Each electric and/or gas corporation is authorized to fully recover in distribution rates the costs of the conversion program approved in Ordering Paragraph 2, subject to reasonableness review. The following ratemaking is approved: actual, prudently incurred program costs shall be entered in a balancing account for recovery in the first year following cut over of service; "to the meter" construction costs must be capitalized based on actual (not forecast) expenditures at the utility's then-current authorized return on rate base; "beyond the meter" construction costs must be capitalized based on actual (not forecast) expenditures and consistent with their status as a regulatory asset, these costs must be amortized over ten years at a rate equivalent to the utility's then-current authorized return on rate base. Review for reasonableness of "to the meter" costs will occur in the general rate case where those costs are put into rate base. Review for reasonableness of "beyond the meter" costs will occur in the first general rate case after service cut over.[63]

1. Safety Culture

In D.14-03-021, the Commission states:

> This rulemaking grapples with issues that have proven intractable for decades. Central to them all is how to ensure the safe, reliable and fairly-priced delivery of electricity, natural gas, or both, to the residents of mobilehome parks and manufactured housing communities (collectively, MHPs) located within the franchise areas of electric and/or natural gas corporations, those Commission-regulated entities commonly referred to as public utilities.[64]

SDG&E's longstanding commitment to safety focuses on three primary areas – (1) employee/contractor safety, (2) customer/public safety, and (3) the safety of the gas delivery system.

Based on the results to date, the Commission-approved MHP Program has been successful in enhancing the safety and reliability of the delivery of natural gas and electricity to

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[62] *Id.* at 3.

[63] *Id.* at 77 (OP 8).

[64] *Id.* at 3-4.

the residents of mobilehome parks and manufactured housing communities that have participated in the MHP Program. The MHP Program has been an effective means for significantly increasing the number of conversions to direct utility service. Moreover, the program team establishes a safety policy that achieves the Program's safety objectives and is consistent with SDG&E's safety-first foundation. From 2014 through 2019, SDG&E maintained a high safety standard with no reportable incidents over approximately 430,000 hours of labor logged between contractors and MHP program employees combined. In 2020, SDG&E continued to maintain a high safety standard with one reportable contractor first-aid incident over approximately 81,000 hours. In 2021, SDG&E was incident free over approximately 74,000 hours of labor for contractors and MHP program employees combined.

2. Standard of Review and Other Commission Guidance

This section of my testimony summarizes the applicable standard of review and other applicable Commission guidance.

a. Preponderance of the Evidence Standard

The standard of proof to be applied by the Commission in an after-the-fact reasonableness review is preponderance of the evidence.[65] Preponderance of the evidence is defined "in terms of probability of truth, *e.g.*, 'such evidence as, when weighed with that opposed to it, has more convincing force and the greater probability of truth.'"[66] In other words, SDG&E "must present more evidence that supports the requested result than would support an alternative outcome."[67]

b. Reasonable Manager Standard

To assess the reasonableness of incurred costs, the Commission applies the reasonable manager standard.[68] To meet this standard, "[t]he act of the utility should comport with what a reasonable manager of sufficient education, training, experience and skills using the tools and

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[65] A. 14-12-016, Assigned Commissioner and Administrative Law Judges' Scoping Memo and Ruling, filed April 1, 2015, at 5; *see also* D.14-06-007 at 13.

[66] D.14-06-007 at 13 (citing Witkin, Calif. Evidence, 4th Edition, Vol. 1, 184).

[67] *Id.*

[68] A.14-12-016, Assigned Commissioner and Administrative Law Judges' Scoping Memo and Ruling, filed April 1, 2015, at 5-6.

knowledge at his disposal would do when faced with a need to make a decision and act."[69] As explained by the Commission, "reasonable and prudent acts do not require perfect foresight or optimum outcomes, but may fall within a spectrum of possible acts consistent with utility needs, ratepayer interests, and regulatory requirements."[70] Under this standard, the Commission holds utilities to "a standard of reasonableness based upon the facts that are known or should be known at the time."[71] In so doing, the Commission looks to the decision-making process and information available to the manager to assess whether the course of action was within the "bounds of reasonableness, even if it turns out not to have led to the best possible outcome."[72] As explained by the Commission, this is to "avoid the application of hindsight in reviewing the reasonableness of a utility decision."[73]

In the case of the MHP Pilot Program, the Commission recognized that "the physical conditions at MHP master-meter / submeter systems will vary greatly, depending upon age, type of materials used in prior construction, existing MHP design, terrain and other factors,"[74] and thus "numerous uncertainties"[75] existed before the MHP Pilot Program commenced and will remain true for the duration of the MHP Program.

C. Program Organization and Governance Controls

1. Master Meter Balancing Account (MMBA) and Nature of Recorded Costs

The MMBA was authorized through Advice Letter 2601-E/2292-G on June 25, 2014. SDG&E records to the MMBA "To The Meter" (TTM) costs, which include costs for utility and contracted labor, purchased services and materials, and trenching and paving. Utility labor costs include civil construction, setting meters, gas and electric service turn-on, purging of gas legacy systems, removal of master meters, and the procurement and warehousing of materials. TTM

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[69] D.90-09-088 at 23.

[70] D.97-08-055 at 109.

[71] D.90-09-088 at 22 (citing D.88-03-036 at 5).

[72] D.89-02-074 at 267 (Conclusion of Law 3).

[73] D.90-09-088 at 22.

[74] D.14-03-021 at 49.

[75] *Id.*

costs also include MHP Program management costs, which are inclusive of: Program Outreach, such as primary customer contact and coordination before, during, and after construction activities in accordance with the Commission-reviewed statewide Outreach Plan; Program Construction Management, which includes construction management (CM) and planning; and Program Management Office (PMO) activities which include program strategy, project controls during the project life cycle, regulatory reporting, and the MHP Program's finance, budgeting, and accounting functions. PMO activities also include communicating progress to various stakeholders.

SDG&E also records to the MMBA "Beyond The Meter" (BTM) costs, which include work related to the connection of new utility services from the utility meter to the mobile home. BTM work is performed by contractors selected by the MHP owners/operators.[76] As such, BTM costs are not directly managed or under the control of SDG&E.

The regulatory accounting treatment of costs recorded to the MMBA is discussed in the Regulatory Accounts testimony of Mr. Kupfersmid (Ex. SDG&E-43).

2. Program Management

SDG&E's MHP Pilot Program management team implemented a series of tools and controls to enable early identification of risks and issues which could negatively impact scope, schedule, or cost. These practices include the below.

a. Experienced Management Staff

To implement the MHP Pilot Program, SDG&E formed an organization led by management personnel experienced in each of the core competencies required by the MHP Pilot Program (*i.e.*, Program Outreach, Planning and Construction, PMO Governance, and Finance). Initially, certain roles, including the Program Directors, PMO Manager, Governance Manager, and Finance Manager, were shared across SDG&E's and Southern California Gas Company's (SoCalGas) MHP Pilot Programs.

The responsibilities of each workstream in the MHP Pilot Program organization were briefly described as follows:

- Customer Outreach and MHP Account Management – The SDG&E Outreach team is responsible for outreach and education to impacted

[76] *Id*. at 47 (Construction).

communities, MHPs, and residents before, during, and after execution of the program and individual projects. To promote efficient and streamlined project execution, the Outreach team works closely with the Planning and Construction Management (CM) team to assess and resolve project risks and issues. Additionally, the Account Management executives work closely with MHP Owners/Operators to implement project-driven outreach and education plans compliant with the statewide MHP Utility Upgrade Program Outreach and Education Plan.

- Planning and CM – The SDG&E Planning and Construction team manages the design through construction components of the MHP utility upgrades.

- Planning – The Planning team assesses each individual project and designs the new gas and electric distribution systems per SDG&E standards.

- CM – The CM team consists of project managers and Field Construction Advisors responsible for reviewing and assessing TTM work performed in the MHPs. The construction management team manages the schedule, scope, and budget of each individual project. While the construction management team does not manage the BTM construction work performed by MHP owner/operator selected contractors, it reviews the scope and costs of BTM bids. This team also coordinates with the BTM contractor to ensure that the interconnection with the SDG&E meters is consistent with utility standards.

- PMO – The PMO defines and maintains standards of project management and compliance within the MHP Pilot Program.

    - Governance – As part of the PMO, the Governance team is responsible for establishing and implementing program controls and processes needed to execute the MHP Pilot Program. This includes risk management, issue management, schedule management, change management, monitoring of key performance indicators (KPIs), project reporting, and business process design.

    - Finance – The Finance team, also part of the PMO, is responsible for establishing and implementing cost and budget controls to confirm accurate cost tracking. Activities include cost accounting and invoice processing, change management, budgeting, and financial reporting.

Since approval of the ten-year program, the organizational structure has been separated between SDG&E and SoCalGas and the costs are therefore no longer shared. The current organizational structure represents the maturity of the program and ongoing management needs.

b. MHP Program's Ongoing Efforts to Minimize Project Execution Costs

The procurement of services (construction contractors, field construction advisors, etc.) is the largest individual category of MHP Program expenditures. Approximately 58% of MHP Program costs are for purchased services and materials. As such, an important aspect of the prudent execution of the MHP Program is sourcing and retaining capable contractors and vendors at reasonable rates. In an effort to control program costs through pre-negotiated rates, SDG&E conducts a competitive solicitation for to-the-meter construction activities within its service territory to identify and select qualified and licensed construction contractors. Contractors known to perform the type of work needed for MHP projects are selected by an experienced team of construction management and sourcing employees.

- Partnerships/Cost Saving/Trench Splitting – When allowed due to service territory overlap, SDG&E works with SoCalGas or willing Communication Infrastructure Providers (CIPs) to share the costs for relevant MHP conversion costs, such as trenching costs, which enables utilities to share the civil construction costs.

- Project Monitoring – SDG&E's MHP Gas Capital Construction team oversees to-the-meter construction activities to confirm that work is safely performed in accordance with project scope, schedule, and budget. Each project is assigned a project manager responsible for reviewing and assessing the activities of the TTM contractor. At the onset of each project, the project manager and program advisor hold a pre-construction meeting with the selected TTM and BTM contractors to review project details, reporting, safety, and other deliverables. Frequent monitoring is performed by the contract administrator and changes, issues, or questions that arise are timely addressed.

- Estimation – SDG&E tracks the costs of construction for each project through internal Work Order Authorizations (WOAs) which are used to track actual costs against the original estimate of total project costs. Costs in excess of estimates require further review and approval through reauthorizations.

- Invoice Validation – Each invoice for TTM or BTM work is reviewed by the program's Finance group and Construction Project Managers to validate that work has been completed in accordance with contractual agreements at the negotiated rates and within authorized limits.

- Project Close-Out/Quality Assurance – SDG&E performs reconciliation and quality assurance following completion of every project to affirm that: (1) records in support of both program and project compliance are reviewed; (2) oversight was provided for project decisions and/or associated changes that occurred; (3) documents are stored in centralized repositories for proper records management; and (4) when final costs have been recorded, total project financial records are reviewed for validity and compared against estimates.

- Diverse Business Enterprises (DBE) – The MHP Pilot Program supports SDG&E's commitments consistent with GO 156 through inclusion of DBE participation as a KPI of the program. During the TTM construction contractor competitive solicitation process, expanding opportunities to DBE contractors was a consideration in the evaluation of contractors. The Project is performing at an approximate 44% DBE level.

- Program Monitoring – SDG&E produces periodic financial and schedule reporting for its management teams to allow continuous oversight over the program, to monitor project progress, and enable early identification of risks and issues impacting schedule and costs.

- Policies and Procedures – SDG&E established a Program Governance Plan (PGP) to document the MHP Program's guidelines and core processes and to facilitate uniformity of repeatable processes. The PGP and supporting documentation are periodically modified and updated to reflect lessons learned through MHP Program activities. In addition, the PGP documents major decisions, including alternatives contemplated, that affect program activities.

- Clarity of Engagement Scope – SDG&E strives to maintain clearly defined program goals with contributing and impacted program stakeholders by working closely with MHP owners/operators through focused outreach efforts to clarify MHP Program components and the commitments required to reduce the risk of ambiguity in covered and non-covered costs. Through outreach efforts, SDG&E works with MHP owners/operators to seek multiple bids for BTM activities, thereby promoting cost awareness and competition. SDG&E also provides workshops to BTM contractors to promote awareness of the program, including its components and goals, and engages BTM contractors

throughout the planning processes, including inviting participation in MHP site walks to more accurately estimate scope, schedule, and budget.

- Communication and Guidance – SDG&E fosters open channels of communication with external program stakeholders, including the Commission's Safety and Enforcement Division (SED), the California Department of Housing and Community Development (HCD), and other local and state entities to promote awareness of the program, share observations and findings, seek guidance, and provide information to better coordinate activities such as inspections.

- Zero Incident Safety Record – Safety is a primary driver of the SDG&E MHP Program and one of its KPIs. The program team consulted with SDG&E's Gas Capital Construction team and Safety Advisor, as well as other Major Projects teams, to establish a safety policy that achieves the program's safety objectives and is consistent with SDG&Es' safety-first foundation. Additionally, SDG&E continues to work with SED to review projects, as requested. To date, all MHP Program projects have been executed with a zero-incident safety record for both internal employees and contractor crews. SDG&E's annual safety statistics are summarized in Table LPK-73 below.

Table LPK-73
SDG&E Company SDG&E MHP Utility Upgrade Program Safety Statistics

INCIDENT TYPE	2017	2018	2019	2020	2021	2022
Lost Time Injury (LTI)	0	0	0	0	0	0
OSHA-Recordable	0	0	0	0	0	0

- Continuous Improvement – Consistent with SDG&E's ongoing commitment to continuous improvement, SDG&E continually evaluates and implements improvements to its MHP Program processes. Though not exhaustive, the following are examples of continuous improvements applied through program implementation:

    - Organizational changes to improve planning and estimation at the onset of individual projects; Organizational changes to support sufficient regional coverage and address workload and geographical spread;

    - Improving cost controls through adoption and improvement of unit-based tasking with TTM contractors and bid and bid-review templates for BTM contractors;

- Introduction and adaptation of change management and close-out processes;
- Working closely with each MHP owner/operator to adapt the Outreach and Education Plan to best suit their needs and minimize project issues;
- Regularly cadenced joint meetings with partner utilities to discuss project schedules, risks, and issues; and
- Development of multiple MHP owner/operator funding options for BTM costs (*i.e.,* payment assignment) to further encourage participation.

Through continuous efforts to improve existing processes and the implementation of each of these changes, the efficiency and cost effectiveness of future MHP Program projects are also improved.

3. Preliminary Cost Summary

As directed by the MHP Decision, on February 1, 2022, SDG&E filed its seventh Annual MHP Utility Upgrade Program Report,[77] which summarizes the MHP Program's preliminary findings and includes: (1) a program timeline and progress towards that timeline, and (2) a preliminary quantification of construction costs recorded per space, with TTM and BTM costs of conversions incurred through December 31, 2021, identified separately. These costs are summarized in Table LPK-74 below.

[77] *See* SDG&E MHP Utility Upgrade Program Annual Report, February 2, 2022, included herein as Appendix C; also *see* D.14-03-021 at 78 (OP 10). Appendix C is a public redacted version. Redacted confidential information is not related to costs in the GRC request.

Table LPK-74
SDG&E Company MHP Conversion Preliminary Costs through 12/31/2021

SDG&E Preliminary Costs to 12/31/2021			
TTM			
Contractor Costs	**Gas**	**Electric**	**Total**
Civil / Trenching	50,309,959	36,140,183	86,450,142
Gas/Electric System Labor			
Materials/Structures	3,400,463	4,395,515	7,795,977
Program Management Costs (PMC)			
PMO	4,579,738	4,741,778	9,321,516
Outreach	899,129	943,997	1,843,126
CM	8,208,405	8,943,531	17,151,936
Other TTM Costs			
Labor	223,166	168,022	391,188
Non-Labor	7,920,438	12,542,382	20,462,820
Property Taxes	385,592	475,488	861,079
AFUDC	1,192,584	1,732,679	2,925,263
Subtotal TTM Costs	77,119,473	70,083,575	147,203,048

BTM Contractor Costs			
Civil / Trenching	907,473	289,284	1,190,757
Gas/Electric System			
Labor	8,678,523	10,975,174	19,653,697
Materials/Structures	3,254,293	8,508,282	11,762,574
Other	6,356,627	9,588,745	15,945,373
Subtotal BTM Costs	19,190,916	29,361,485	48,552,407

Total (Preliminary Costs) to 12/31/2021	96,310,389	99,445,060	195,755,449

Table LPK-74 details preliminary costs for each of the following categories:

- TTM Contractor Costs, which include trenching and paving.
- Other TTM Costs – This includes the costs of Company labor in support of the program, including TTM work for selected MHPs, setting meters and turning on

gas and electric service, purging the legacy system, removal of the master meter, and the procurement and warehousing of materials.

- Beyond-the-Meter Contractor Costs, which are costs reimbursed to the MHP owner/operator to perform BTM construction work. BTM contractors are selected by the MHP owner/operator.

- Program Management Costs (PMC), which are comprised of:

  - PMO Costs, which include overall Program Management (*e.g.*, Program strategy, risk management, change management, schedule management) and the Program's Finance functions;

  - CM Costs, which include: construction project management; preliminary planning and full design activities; planners and designers who perform work for multiple parks; Project Managers, Construction Contractor Administration staff, and other support personnel who also perform work at multiple construction sites; and

  - Outreach activities, which include primary customer and stakeholder contact and coordination before, during and after construction, consistent with the Commission-approved statewide Outreach Plan.

PMC are tracked separately from TTM costs and BTM contractor costs and allocated to each MHP as part of the project close-out process based on the number of spaces converted.

The above costs are fully loaded and include Company Overheads consisting of Payroll Tax, Incentive Compensation Plan, Pension and Benefits, Worker's Compensation, Vacation and Sick, Personal Liability and Property Damage Overhead, Purchasing, Warehouse, Shop Overhead, Small Tools, and Administrative and General capital. The overheads applied to the Program are driven by incremental costs incurred as a result of implementing the MHP Pilot Program.

Please see Appendix C for additional information regarding recorded MHP Program costs.

The observed preliminary average per-space costs for the period ending December 31, 2021, are summarized in Table LPK-75. The Average Cost Per Space is impacted by a variety of issues, including but not limited to cultural and environmental impacts, hard digging and material price fluctuation.

Table LPK-75
SDG&E Company MHP Utility Upgrade Preliminary Average Per-Space Cost as of December 31, 2021

SDG&E	Average Cost Per Space (GAS)	Average Cost Per Space (ELECTRIC)	Overall Average Cost Per Space	Spaces Converted Gas	Spaces Converted Electric
TTM	$11,631	$10,136	$21,498	6,788	6,914
BTM	$3,002	$4,397	$7,399	6,393	6,677
Total Average Cost Per Space	$14,363	$14,534	$28,897		

D. Conclusion

This section of my testimony demonstrates that the $195.8 million in costs recorded by SDG&E from January 1, 2017, through December 31, 2021, in the ongoing execution of the MHP Program have been reasonably incurred. These costs directly support achievement of the Commission's stated objective to convert higher risk master-meter/submeter systems that supply natural gas to MHPs or manufactured housing communities to enhance the safety and reliability of MHP communities.[78]

In accordance with the reasonable manager standard, SDG&E designed and executed the MHP Program to enhance the safety and reliability of utility service to the many MHP communities that have participated in the MHP Program while maintaining reasonable conversion costs through prudent planning and oversight.

VII. CONCLUSION

SDG&E requests the Commission adopt its TY 2024 forecast of $41,843,000 for Gas Distribution O&M expenses. This increase is driven by increased agency regulations and requirements, economic conditions, system expansion, infrastructure renewal, field technical skills training and qualification, risk mitigation activities, and integration and support of new tools.

SDG&E further requests the Commission adopt its capital forecast of $132,585,000, $135,392,000, and $122,799,000, in 2022, 2023, and 2024, respectively and IT projects

[78] D.14-03-021 at 75 (OP 3).

presented in this testimony. The primary factors influencing the capital forecast are anticipated increases in new business-related activity and pipeline system renewal work.

These forecast expenditures support Gas Distribution's fundamental philosophy of maintaining operational excellence while providing safe, reliable delivery of gas energy at a reasonable cost to customers. The Commission should find this request reasonable in that:

- The activities maintain and enhance the delivery of sustainable, safe, and reliable service that SDG&E has been providing customers for many years;
- The activities are consistent with laws, operational codes and standards established by local, state, and federal legislators and agencies;
- The activities respond to operations, maintenance, and construction needs associated with projected customer and system growth and demands of cities, counties, and state agencies under the Company's franchise agreements; and
- The forecast amounts are reasonable in light of historical spending and anticipated work increases.

SDG&E faces several challenges affecting both the physical operation of the pipeline system and cost management aspects of its business. Operations and maintenance requirements increase as the system expands; additional maintenance and replacement work is required to continue to maintain reliability of an aging infrastructure; agencies and regulatory bodies continue to impose operating conditions that increase the cost of doing business; and with this all employees must be trained and ready to respond. The forecast presented in this testimony reflects SDG&E's best judgment of work and the associated costs required to:

- Operate and maintain its gas distribution system in a manner that safeguards the safety of the public and employees.
- Construct new gas distribution facilities in accordance with the Company's obligation to serve and to maintain system reliability.
- Replace existing facilities that are experiencing deterioration to safeguard infrastructure integrity and public safety.
- Respond to customer and governmental agency requests to remain in compliance.

Accordingly, SDG&E's TY 2024 forecast is a reasonable estimate of future requirements and should be adopted by the Commission.

This concludes my prepared direct testimony.

VIII. WITNESS QUALIFICATIONS

My name is L. Patrick Kinsella. My business address is 8335 Century Park Court, San Diego, California, 92123. I am employed by SDG&E as Director, Gas Operations. I have been employed by SDG&E since 1982. I have 40 years of experience in the utility industry. While at SDG&E, I have held various staff and line positions in the functional areas of Gas Distribution, Electric Regional Operations, and Mobile Home Park Upgrade Program.

My present responsibilities include providing leadership to a team of professionals responsible for the safe and reliable delivery of natural gas energy through the distribution pipeline network, including the operation, maintenance, installation, and replacement of the gas distribution system at SDG&E. I also provide leadership for a group that provides technical support for gas distribution project management and construction activities. This includes gas distribution planning and system design; emergency preparedness, response, and recovery; the preparation and management of O&M and capital budgets; and implementing large-scale distribution integrity projects.

I earned a Bachelor of Science Degree in 2015 from University of Phoenix, San Diego. I sponsor the TY 2024 GRC testimony for SDG&E's Gas Distribution O&M expenses and capital spending plan.

I have not previously testified before the Commission.

APPENDIX A

Glossary of Terms

APPENDIX A
Glossary of Terms

Acronym	Definition
BC	Budget Code
C&O	Construction and Operations
Caltrans	California Department of Transportation
CBT	Computer terminal based training
CFF	Cross-Functional Factor
C.F.R.	Code of Federal Regulations
CIAC	Contributions In Aid of Construction
CMP	Corrective Maintenance Program
CNG	Compressed Natural Gas
CO	Collectible
CP	Cathodic protection
CPUC	California Public Utilities Commission
DIMP	Distribution Integrity Management Program
DOT	Department of Transportation
EFV	Excess Flow Valve
EPC	Electronic Pressure Corrector
EPM	Electronic pressure monitors
Ex	Exhibit
FUS	Field Utility Specialist
GGIS	Gas Graphical Information Systems
GHP	Gas Handling Plan
GIS	Geographic Information System
GO	General Order
GRC	General Rate Case
ICS	Incident Command System
L&M	Locate and Mark
LPCMA	Litigated Project Costs Memorandum Account
M&R	Measurement and Regulation
MAOP	Maximum allowable operating pressure
MDT	Mobile Device Terminal
MHP	Mobilehome Park Utility Upgrade Program
MSA	Meter set assembly
NC	Non-Collectible
NDE	Non-Destructive Examination
NGV	Natural Gas Vehicle
NRF	National Response Framework
NTSB	National Transportation Safety Board
O&M	Operations and Maintenance
OpQual	Operator Qualification

Acronym	Definition
PHMSA	Pipeline and Hazardous Materials Safety Administration
PMC	Planned Meter Changeouts
PPE	Personal Protective Equipment
psi	Pounds per square inch
PSMS	Pipeline Safety Management System
QA	Quality Assurance
QC	Quality Control
RAMP	Risk Assessment Mitigation Phase
RMU	Remote Monitoring Unit
SB	Senate Bill
SCFH	Standard Cubic Feet per Hour
SDG&E	San Diego Gas & Electric Company
SED	Safety and Enforcement Division
SME	Subject matter expert
SMYS	Specified Minimum Yield Strength
SoCalGas	Southern California Gas Company
TY	Test Year
USA	Underground Service Alert

APPENDIX B

RAMP Risk Chapter and Activity to Workpaper Matrix

APPENDIX B
RAMP Risk Chapter and Activity to Workpaper Matrix

TABLE LPK-76
RAMP Risk Chapter and Activity to O&M Work Paper Matrix

GAS DISTRIBUTION **RAMP Activity O&M Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**BY2021 Embedded Base Costs (000s)**	**TY2024 Estimated Total (000s)**	**TY2024 Estimated Incremental (000s)**	**GRC RSE**
1GD001.000	SDG&E-Risk-9 - C07	Pipeline Monitoring (Leak Mitigation, Bridge & Span, Unstable Earth, and Pipeline Patrol	2,067	2,067	0	-
1GD002.000	SDG&E-Risk-7 - C03	Locate & Mark Activities (MP)	6,538	9,436	2,898	7
1GD002.000	SDG&E-Risk-7 - C04	Locate & Mark Activities (HP)	185	268	83	482
1GD002.000	SDG&E-Risk-7 - C09	Locate & Mark Quality Assurance	393	393	0	2
1GD003.000	SDG&E-Risk-9 - C06	Leak Repair – Main Portion	956	1,158	202	-
1GD003.000	SDG&E-Risk-9 - C11	Gas Distribution Emergency Department - Main Portion	1,230	1,734	504	-
1GD004.000	SDG&E-Risk-9 - C06	Leak Repair – Service Portion	1,561	1,622	61	-
1GD004.000	SDG&E-Risk-9 - C11	Gas Distribution Emergency Department - Service Portion	820	1,155	335	-
1GD005.000	SDG&E-Risk-8 - C10	Personal Protective Equipment	441	441	0	-
1GD007.000	SDG&E-Risk-9 - C04	Regulator Station, Valve,	4,028	3,987	-41	-

GAS DISTRIBUTION
RAMP Activity O&M Forecasts by Workpaper (In 2021 $)

Workpaper	RAMP ID	Description	BY2021 Embedded Base Costs (000s)	TY2024 Estimated Total (000s)	TY2024 Estimated Incremental (000s)	GRC RSE
		and Large Meter Set Inspection				
1GD007.000	SDG&E-Risk-9 - C17	Control Center Modernization	0	480	480	-
1GD008.000	SDG&E-Risk-9 - C01	Cathodic Protection - O&M	2,049	1,834	-215	-
1GD009.000	SDG&E-CFF-1 - 1	AIM (Gov, Strat, AIP)	0	110	110	-
1GD009.000	SDG&E-CFF-6 - New 02	Gas Geographic Information System	591	591	0	-
1GD009.000	SDG&E-CFF-6 - New 03	Gas Geographic Information System	0	58	58	-
1GD010.000	SDG&E-Risk-7 - C01	Locate & Mark Training Groupings	746	746	0	-
1GD010.000	SDG&E-Risk-9 - C14	Human Factors Mitigations - Ops Qual Training	1,661	1,661	0	0.5
1GD010.000	SDG&E-Risk-9 - C15	Human Factors Mitigation - QA/QC Program	300	300	0	-
Total			**23,566**	**28,041**	**4,475**	

TABLE LPK-77
RAMP Risk Chapter and Activity to Capital Work Paper Matrix

GAS DISTRIBUTION **RAMP Activity Capital Forecasts by Workpaper (In 2021 $)**						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE**
005000.003	SDG&E-Risk-9 - C19	Field and Public Safety	569	569	569	0.3
005010.003	SDG&E-Risk-3 - M04	Adobe Falls Relocation Project	2,192	1,891	0	-
005010.004	SDG&E-Risk-9 - M04 (New)	RAMP Incremental: MSAs inside Bldgings and Alcoves	1,400	1,400	0	-
005060.002	SDG&E-Risk-7 - C13	Locating Equipment	225	225	225	181
005060.003	SDG&E-Risk-9 - C14	Human Factor Mitigations - OpQual Training & Cert	440	440	440	0.5
005070.001	SDG&E-Risk-9 - C10	Code Compliance Mitigation	2,662	2,662	2,662	1
005080.001	SDG&E-Risk-9 - C06	Leak Repair (Capital)	11,935	12,973	14,010	-
005090.001	SDG&E-Risk-9 - C02	Cathodic Protection Program - Capital	4,493	4,493	4,493	-
005100.001	SDG&E-Risk-9 - C05	Reg Station Replacement Program	1,956	1,956	1,956	-
005140.001	SDG&E-Risk-9 - C08-T3	Underperforming Steel Replacement Program - Other Steel (Post-1965 Vintage)	3,001	3,001	3,001	1
125510.001	SDG&E-Risk-9 - C12	Cathodic Protection System Enhancements	1,996	1,996	1,996	-
125510.002	SDG&E-Risk-9 - M2	Cathodic Protection System Enhancements – Real Time Monitoring	225	0	0	0
195640.001	SDG&E-Risk-9 - C08-T2	Underperforming Steel Replacement Program (1934-1965 Vintage)	3,000	3,000	3,000	0.2

GAS DISTRIBUTION
RAMP Activity Capital Forecasts by Workpaper (In 2021 $)

Workpaper	RAMP ID	Description	2022 Estimated RAMP Total (000s)	2023 Estimated RAMP Total (000s)	2024 Estimated RAMP Total (000s)	GRC RSE
195650.001	SDG&E-Risk-9 - C8-T1	Underperforming Steel Replacement Program – Threaded (Pre-1934 Vintage)	7,000	7,000	7,000	0.2
195660.001	SDG&E-Risk-9 - C09-T2	Early Vintage Program (Components) – Dresser Mech Coupling Removal	2,000	2,000	2,000	1
195670.001	SDG&E-Risk-9 - C09-T1	Early Vintage Program (Components) – Oil Drip Piping Removal	1,500	1,500	1,500	10
195680.001	SDG&E-Risk-9 - C03	Piping in Vaults Replacement Program	1,500	1,500	1,500	3
195690.001	SDG&E-Risk-9 - C09-T3	Early Vintage Program (Components) – Remove Closed Valves b/w HP/MP Zones	1,500	1,500	1,500	1
215740.001	SDG&E-Risk-9 - C17	CCM Distribution Field Asset Real Time Monitoring and Control Site Installations/Upgrades & New Control Room Technologies	449	3,235	4,080	-
215750.001	SDG&E-Risk-9 - M03	Replace Curb Valves with EFVs	1,000	1,750	1,750	11
G09020.002	SDG&E-Risk-9 - C13	Human Factors Mitigations - Gas Handling Plans	294	369	445	-
G09020.003	SDG&E-CFF-6 - New	RAMP: SDG&E-CFF-6, New: Gas Geographic Information System Group	1,191	1,191	1,191	-
G09020.009	SDG&E-CFF-6 - New	GGIS Growth	107	204	194	-

GAS DISTRIBUTION RAMP Activity Capital Forecasts by Workpaper (In 2021 $)						
Workpaper	**RAMP ID**	**Description**	**2022 Estimated RAMP Total (000s)**	**2023 Estimated RAMP Total (000s)**	**2024 Estimated RAMP Total (000s)**	**GRC RSE**
Total			**50,635**	**54,855**	**53,512**	

APPENDIX C

2021 Mobilehome Park Utility Upgrade Program Report

APPENDIX C
2021 Mobilehome Park Utility Upgrade Program Report

On February 1, 2022, in accordance with Ordering Paragraph 10 of the Decision, SDG&E filed its Annual Report, which summarizes the MHP Program's preliminary quantification of construction costs incurred per space identified separated by To-the-Meter (TTM) and Beyond-the-Meter (BTM) costs for mobilehome park (MHP) conversions through December 31, 2021.[1]

[1] The SDG&E Mobilehome Park Utility Conversion Program Annual Report (February 1, 2022), and served in accordance with D. 14-03-021 Ordering Paragraph 10, is a public redacted version. Redacted confidential information is not related to costs in this GRC request.

SDG&E 2024 GRC Testimony Revision Log –August 2022

Exhibit	Witness	Page	Line or Table	Revision Detail
SDG&E-04	L. Patrick Kinsella	LPK-vii	Summary Capital Table	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-vii	1st Paragraph	Changed $129,954,000 to $ 132,585,000, $132,533,000 to $135,392,000 and $120,072,000 to $122,799,000
SDG&E-04	L. Patrick Kinsella	LPK-1	Line 12	Changed $129,954,000 to $ 132,585,000, $132,533,000 to $135,392,000 and $120,072,000 to $122,799,000
SDG&E-04	L. Patrick Kinsella	LPK-1 and LPK-2	Table LPK-1	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-68	Lines 26 and 27	Changed $129,954,000 to $ 132,585,000, $132,533,000 to $135,392,000 and $120,072,000 to $122,799,000.
SDG&E-04	L. Patrick Kinsella	LPK-69 and LPK-70	Table LPK-29	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-80	Table LPK-35	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-101	Line 18	Changed WP to CWP
SDG&E-04	L. Patrick Kinsella	LPK-120	Line 27	Changed WP to CWP
SDG&E-04	L. Patrick Kinsella	LKP-121	Line 4	Changed WP to CWP
SDG&E-04	L. Patrick Kinsella	LPK-122	Table LPK-68	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-129	Line 3	Changed $19,878,000 to $21,856,000, $21,815,000 to $23,987,000 and $21,020,000 to $23,113,000
SDG&E-04	L. Patrick Kinsella	LPK-129	Line 5	Changed $21,012,000 to $22,990,000, $22,940,000 to $25,112,000 and $22,481,000 to $24,574,000
SDG&E-04	L. Patrick Kinsella	LPK-129	Table LPK-70	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-130	Line 20	Changed $5,239,000 to $5,251,000, $5,392,000 to $5,404,000 and $5,505,000 to $5,517,000
SDG&E-04	L. Patrick Kinsella	LPK-131	Line 11	Changed $5,330,000 to $5,342,000, $5,682,000 to $5,695,000 and $5,880,000 to $5,893,000

Exhibit	Witness	Page	Line or Table	Revision Detail
SDG&E-04	L. Patrick Kinsella	LPK-132	Table LPK-71	Revised Table
SDG&E-04	L. Patrick Kinsella	LPK-133	Line 6	Changed “Gas Department Overhead” to “Contract Administration”
SDG&E-04	L. Patrick Kinsella	LPK-133	Line 7	Changed $5,825,000 to $6,466,000, $6,129,000 to $6,803,000 and $5,633,000 to $6,254,000
SDG&E-04	L. Patrick Kinsella	LPK-133	Lines 19 and 20	Changed $5,825,000 to $6,466,000, $6,129,000 to $6,803,000 and $5,633,000 to $6,254,000
SDG&E-04	L. Patrick Kinsella	LPK-133	Line 22	Changed $5,825,000 to $6,466,000, $6,129,000 to $6,803,000 and $5,963,000 to $6,584,000
SDG&E-04	L. Patrick Kinsella	LPK-149	Lines 21 and 22	Added word “capital” and changed $129,954,000 to $ 132,585,000, $132,533,000 to $135,392,000 and $120,072,000 to $122,799,000.