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Proceeding: 2028 General Rate Case
Application: A.26-06-XXX
Exhibit: SDGE-06-WP-S

**SUPPLEMENTAL WORKPAPERS TO
PREPARED DIRECT TESTIMONY
OF DEVIN K. ZORNIZER
(GAS MAJOR PROJECTS)**

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**

VOLUME 3 OF 6

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**SDG&E Control Center Modernization – HCA Methane
Sensor Project Workpaper**

HCA Methane Sensor Project

1. Project Overview

The HCA Methane Sensor Project is requesting authorization of a forecasted total amount of \$2.7 million between 2026-2028 within this 2028 General Rate Case. The HCA Methane Sensor Project was initiated as part of post-San Bruno pipeline safety enhancements and the broader Pipeline Safety Enhancement Plan (PSEP)¹. Its objective is to strengthen methane leak detection in high-consequence areas (HCAs)². Early proof-of-concept work, conducted in 2015–2016, deployed ten sensors using Advanced Meter radio modules in support of General Rate Case (GRC) filings.

The project was formally approved in the 2019 GRC³, authorizing the deployment of approximately 2,100 pole-mounted sensors. Additional support for the project, including continuation under the Control Center Modernization (CCM) program and construction of the new Gas Control Room and Emergency Operations Center, was authorized in the 2024 GRC⁴.

Originally proposed in 2019 to provide methane detection near high-occupancy and hard-to-evacuate locations, the program moved into implementation in late 2024 following the development of foundational business processes required for installation and ongoing operational readiness and IT/OT system enhancements for data collection and control room visualization.

2. Organizational Readiness and Early Execution

2.1 Business Readiness (2023–2024)

To prepare for deployment, San Diego Gas and Electric (SDG&E) carried out organizational change management and readiness efforts across operational groups including Transmission, the Network Operations Center (NOC), and Gas Control. These efforts were designed to ensure teams were fully prepared to respond to methane alarms and effectively integrate new technologies and procedures

¹ The project was first introduced in 11-02-019 at p.86-89, then re-introduced in SCG-08-R_Bermel at p.MAB-30-32

² “A High Consequence Area (HCA) is a location defined by the Pipeline and Hazardous Materials Safety Administration (PHMSA) where a natural gas transmission pipeline failure could have significant impacts on people or property, including Class 3 and Class 4 locations or areas within the pipeline’s potential impact radius that contain a sufficient population or identified sites, as defined in 49 CFR § 192.903.

³ Project approval received in D.19-09-051 at p.127-132

⁴ Updates to the scope including a name change from DOCC to Control Center Modernization (CCM) introduced in SCG-06-2R at p.CHB-85-87 and described further in Appendix D. The Commission approved a portion of the request in D.24-12-074 at p.192-194

into daily operations sought to properly equip teams on how to respond to methane alarms and integrate new technology and procedures into their daily workflows.

2.2 Process & Engineering Development

As these readiness activities progressed, SDG&E developed the processes and engineering foundation required to support a large-scale deployment of this new technology. The work was centered on defining end-to-end workflows, validating technical design elements, preparing training materials for field personnel, and establishing the teams required to support a sustained multi-year rollout. More specifically, these efforts consisted of:

- Enterprise-wide collaboration that resulted in comprehensive Business Process Designs (BPDs) which define installation, monitoring, maintenance, and incident response activities.
- Engineering teams finalized and validated a sensor design utilizing long-established industry technologies suitable for installation within public rights-of-way.
- Version 1 (V1) site maintenance training materials were developed in support of maintaining and responding to leak indications.
- A dedicated deployment and business-development team was established to support a multi-year rollout.

2.3 Site Selection

Initially, prior to the 2019 GRC application, a system-wide analysis across SDG&E's territory was performed to identify potential sites for future installation between high-pressure pipelines and evacuated challenged infrastructure within defined HCAs. The originally estimated 2,100 sites were selected by factoring in high-occupancy, evacuation challenged buildings within HCAs that are located within 220 yards of a high-pressure, large diameter gas transmission pipeline. Of the 2,100 sites, 400 were in SDG&E territory. Upon project initiation, site selection criteria were further refined to identify sites for installation near specific types of evacuation challenged infrastructure within HCAs.

It was determined that an increased focus would be placed on areas with higher occupancy and facilities of large gatherings such as schools, hospitals, event centers, and places of worship. Additional criteria included identifying evacuation challenged locations, distance from transmission pipeline and evacuation challenged facilities, wind direction for sensor placement, and constructability. The number of sensors to install would be one sensor per building that is 200 ft. or less in length. Buildings greater than 200 ft. in length would get two or more with at least one sensor

at each end. The outcome of refining these criteria reduced the previous projected total from 2,100 to 1,400 sites of those, 170 are SDG&E's.

3. New and Evolving Technologies

SDGE works with SoCalGas resources to continually evaluate advancements of field-deployable hardware and communication technologies. While V1 sensors were being deployed, SoCalGas resources simultaneously investigated and ultimately pursued next-generation solutions to improve affordability, installation efficiency, and maintenance performance.

This work led to the development of the integrated Version 2 (V2) sensor design, which modernizes the approach to methane monitoring.

3.1 V1 vs. V2 – Key Improvements

- **Optimized site design:** The V2 sensor's site design has a smaller footprint, simplified construction, and integrated milepost marker and pedestal mounting design — reducing overall costs, installation time, permitting needs, and long-term maintenance costs while enabling faster deployment across field locations.
 - Example: The V1 sensor requires a seven-foot concrete foundation, which involves substantial excavation, a fabricated re-bar support structure and a full concrete pour, and several weeks of curing time before the pole and associated equipment can be installed. Alternatively, the V2 installation does not require a concrete foundation and can be secured either by direct attachment to a concrete surface (sidewalk, existing footing, etc.) or direct bury it in the ground at one and half feet below the surface.
- **Improved sensing technology:** Leveraging emerging methane sensor technology with higher detection capability, lower power usage, and a smaller form factor.
 - V2 can operate all features for over one-year on a single set of four D-cell lithium batteries, whereas V1 relied on two 37-pound gel deep-cycle batteries that provided only about five-days of operation without solar charging.
 - V2 operates solely on batteries, improving field reliability by eliminating dependence on solar power and enabling installations in areas with limited or obstructed sunlight.
 - The V2 design uses a more sensitive and accurate sensor optimized for low-level methane detection, down to accuracy of +- 5 PPM opposed to V1's accuracy of +- 1,500 PPM.

Increased site diagnostics capabilities: Additional sensor status monitoring points such as battery voltage, signal strength, and tilt alarms improve diagnostic capabilities and methane-monitoring performance. V1 sensors only provide concentration level data without the other system health indicators that the V2 unit can provide.

- **Modern communications protocol:** Leverages Message Queuing Telemetry Transport (MQTT), a lightweight, secure communications protocol optimized for low-power devices and reliable data delivery in challenging field environments. MQTT reduces data usage and improves transmission efficiency through the following features:
 - Efficient binary encoding minimizes data volume transmitted.
 - Small, optimized message payloads designed to reduce overhead and conserve bandwidth.
 - Publish/subscribe architecture that ensures only relevant data is delivered to subscribed systems, eliminating unnecessary transmissions.
 - Persistent session support, which reduces connection re-establishment overhead and lowers overall data usage.

Collectively, these advancements reflect the natural progression from the V1 design to V2, with V2 providing improved capabilities and increased operational performance.

4. Benefits

After the 2024 GRC decision, SoCalGas and SDG&E began installing V1 sensors and determined that the design entailed higher costs, increased operational complexity, more demanding long term maintenance needs and safety considerations than could be fully identified during earlier planning. Due to these factors, SoCalGas reassessed the deployment approach and transitioned future installations to the V2 design to better manage risk, enhance safety, and control program costs while continuing to meet the program's safety objectives.

SDGE followed SoCalGas' lead in transitioning the HCA Methane Sensor Program from the earlier V1 sensor technology to the more advanced V2 sensors as the program matured. This transition enables substantially more efficient and cost-effective installation and maintenance activities, resulting in meaningful reductions in overall program costs while continuing to deliver safety benefits for SDGE's ratepayers.

4.1 V2 Cost Benefits

As mentioned in Section 3, transitioning from the V1 to the V2 sensor improved the overall affordability and effectiveness of the methane sensor project as summarized below:

- **Installation costs are reduced** due to simplified hardware, no concrete foundations, and no need for specialized equipment or activities (i.e.: extensive traffic control, crane or bucket truck use).
 - Costs for V2 installations are consistent versus V1 which can vary widely depending on local site conditions, fluctuation in material and services pricing, and differing requirements from the jurisdictions for construction.
- **Operational (O&M) costs are reduced** due to fewer materials, better accessibility, and less time-consuming annual service requirements. Overall, there's a significant forecasted reduction in cost for O&M with going from the V1 design to the V2 design.
- **Potential lower vandalism** since the equipment being used is low profile and inconspicuous compared to the V1's sixteen-foot pole with solar panels displayed.
- **Lower remediation cost** since the V2 installation is ground based and does not require extensive traffic control or bucket trucks to service or maintain related equipment.
- **Simplified maintenance** due to V2 only requiring annual battery replacements, which can be completed at ground level without special equipment.

As V2 testing and development advanced, a planned V1-to-V2 transition was established to facilitate V2 deployment. See section 5, Deployment Schedule for latest deployment timeline.

4.2. Safety Benefits

Safety is the primary driver of the HCA Methane Sensor Project and the V2 sensor contributes meaningful operational and public-safety improvements in addition to 24/7 monitoring and near real-time methane detection, such as:

- **Enhanced telemetry** improves situational awareness and supports preventative maintenance.
- **Reduced installation risk** from minimized ground disturbance and fewer underground utility conflicts.
- **Lower employee exposure** by eliminating elevated height work, removing bucket truck activities, and reducing interactions with work zone traffic.
- **Lighter, simpler equipment** reduces risk of vehicle-related injuries during transport and installation.

Overall, V2 improves leak-detection performance while reducing safety risks across construction, maintenance, and emergency-response operations.

5. Deployment Schedule

5.1 Deployment Timeline

Deployment of the V1 methane sensors began in 2025 with the installation of 19 V1 HCA Methane Sensors. In 2026 SDG&E followed SoCalGas’ lead to transition their design to the V2 sensors. and continued into 2025, at which point V1 installation activities were phased out as V2 sensor design, data path development, and production readiness work progressed. During this period, the foundational processes and business readiness materials established for V1 were updated to incorporate the requirements of the new V2 technology. The finalized V2 design began deployment in 2026.

By the end of 2027, SDGE anticipates installing an additional 100 V2 methane sensors, supplementing the 19 V1 installations previously completed. As part of the continued assessment of Transmission system HCAs, the total program installation target has been updated to 170 across the service territory. From 2028 through 2031, SDGE plans to deploy 51 of these remaining V2 installations.

5.2 Installation Summary Table

V1 Sensors (Installed)	V2 Sensors (Plan)							
	2026	2027	2028	2029	2030	2031	2028-2031 Sub Total	Total
2025	50	50	51	0	0	0	51	170

6. Cost Estimate Methodology

6.1 Basis of Estimated Costs

Overview

The capital cost methodology for the HCA Methane Sensor program uses a **zero-based forecasting** method for both labor and non-labor costs. This method is required because the program’s historical

costs do not reflect the future deployment conditions of the V2 sensor design, which differ substantially from V1 in technology, form factor, and installation process.

Labor Cost Methodology

Labor costs are estimated using a **per-unit forecast**, multiplied by the planned number of annual installations. The estimate includes end-to-end project activities such as project management, planning, permitting, configuration, construction, commissioning, and closeout. For the V2 per-unit labor cost estimate, V1 cost data was used as a baseline and updated to reflect current labor rates and revised levels of effort based on the latest design.

Non-Labor Cost Methodology

Like labor, non-labor costs use a **per-unit forecast**, multiplied by the annual target number of installations. These costs include contractor labor, unit purchases, engineering design support, material storage, and site document and system update reconciliation activities. For the V2 per-unit non-labor cost estimate, V1 cost data was used as a baseline and updated to reflect current contractor rates, revised levels of effort based on the latest design, and the most recent material cost estimates.

CCM - High Consequence Area (HCA) Methane Sensors								
Unit Count - HCA Methane Sensors								
	2026	2027	2028	2029	2030	2031	2024-2027 Total	2028-2031 Total
HCA Methane Sensors	50	50	51	0	0	0	119	51
Cost Per Sensor Breakdown & Assumptions								
Cost Per Sensor: Project Management & Field Engineering								
COST TYPE	LABOR/NON-LABOR	CLASSIFICATION	DESCRIPTION	V2 COST				
Capital	LABOR	INTERNAL RESOURCES	Project Mgmt, Construction Mgmt, Business Readiness, Ac	\$ 6,298.24				
Capital	NON-LABOR	EXTERNAL RESOURCES	Procurement, Engineering Support, Construction Mgmt	\$ 1,082.35				
Capital	NON-LABOR	MATERIALS & EXPENSES	Materials and Misc.	\$ 70.59				
				Total Unit Cost \$ 7,451.18				
Cost Per Sensor								
COST TYPE	LABOR/NON-LABOR	CLASSIFICATION	DESCRIPTION	V2 COST				
CAPITAL	NON-LABOR	EXTERNAL RESOURCES	ENVIRONMENTAL, OTHER REVIEWS	\$ 750.00				
CAPITAL	NON-LABOR	EXTERNAL RESOURCES	DRAWINGS	\$ 2,000.00				
CAPITAL	NON-LABOR	EXTERNAL RESOURCES	CONTRACT INSTALL/CONFIGURE	\$ 2,000.00				
CAPITAL	NON-LABOR	MATERIALS & EXPENSES	PERMIT	\$ 850.00				
CAPITAL	NON-LABOR	MATERIALS & EXPENSES	V2 SENSOR/COMMUNICATION UNIT	\$ 2,411.00				
CAPITAL	NON-LABOR	MATERIALS & EXPENSES	ENCLOSURE/MOUNTING HARDWARE	\$ 800.00				
				Total Unit Cost \$ 8,811.00				
Capital Forecast								
		2026	2027	2028	2029	2030	2031	Total
Labor	Internal Labor	\$ 320,700	\$ 320,700	\$ 321,210	\$ -	\$ -	\$ -	\$ 962,610
	External Resources	\$ 55,200	\$ 55,200	\$ 195,450	\$ -	\$ -	\$ -	\$ 305,850
Non-Labor	Construction	\$ 280,000	\$ 280,000	\$ 102,000	\$ -	\$ -	\$ -	\$ 662,000
	Materials & Expenses	\$ 164,150	\$ 164,150	\$ 210,711	\$ -	\$ -	\$ -	\$ 539,011
	Total Capital	\$ 820,050.00	\$ 820,050.00	\$ 829,371.00	\$ -	\$ -	\$ -	\$ 2,469,471.00
Assumptions								
This information will allow Gas Control to complement existing pipeline safety efforts to identify abnormal operating conditions or emergency conditions more quickly for increased system integrity and remediation response in support of enhanced public and employee safety.								
The CCM HCA Methane Sensor project will not replace any existing activities intended for pipeline safety. This includes but is not limited to leak surveys, aerial monitoring, and vehicle monitoring. Permits will be needed for all installation sites as they will be installed in public right of way (PROW).								

Figure-1

V1 and V2 Comparison

(left - the V1 sensor design, center – V2 integrated milepost marker, right – V2 integrated pedestal)



Figure-2
V1 Sensor

Enclosure, Sensor, Pole, Foundation (solar panel not shown)



Figure-3
V2 Sensor

Integrated Milepost Maker and Pedestal Designs (V2 integrated milepost marker on the left, V2 integrated post on the right)



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**SDG&E Control Center Modernization – Distribution
Regulator Station Project Workpaper**

Distribution Regulator Station Project

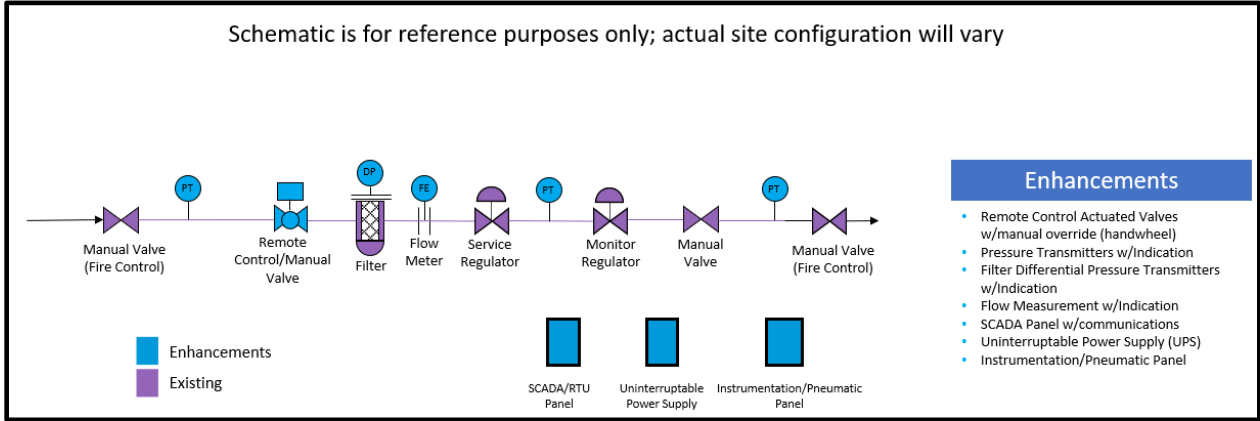
1. Project Overview

The Distribution Regulator Station (DRS) Project is enhancing the San Diego Gas and Electric (SDG&E) gas distribution system by equipping DRSs with remote-control functionality and real-time pressure monitoring. These upgrades will increase operational awareness, enable faster identification of abnormal operating conditions and enhance remote response capabilities. This project is an ongoing effort of the broader Control Center Modernization (CCM) program, which was authorized in both the 2019 and 2024 General Rate Case (GRC) proceedings¹.

The 2024 GRC authorization for the SDG&E DRS project included enhancing 5 DRSs with remote control and real-time monitoring capabilities by Test Year (TY) 2024, with a total of 20 stations by 2028. As the project scope was authorized, full execution did not proceed as originally scheduled due to the need to address foundational readiness requirements before the field enhancement projects could begin. The revised implementation plan reflects a phased rollout of 16 DRS enhancement projects between 2026 and 2031 and remaining 4, through 2033, aligned with completed training, updated engineering designs, and standardized operational processes.

The installation includes remotely actuated control technologies and real-time monitoring equipment. Figure 1 illustrates how the program will integrate this new equipment into an existing DRS.

Figure 1: Illustration of the Enhancement at a natural gas distribution regulator site (DRS)



¹ This work has been authorized in D.19-09-051 at 127-132, known as the Distribution Operations Control Center (DOCC) and D.24-12-074 at 153-157

1.1 Rationale (Safety Benefits)

The proposed activities support the Company's broader efforts to enhance safety, sustainability, and system reliability through the deployment of industry leading monitoring and control technologies within SDG&E's gas operations. The DRS project is a Risk Assessment and Mitigation Phase (RAMP) activity² designed to reduce the likelihood and consequence of system overpressure events. By equipping distribution field assets with remote-control functionality and real-time pressure monitoring, SDG&E will significantly enhance operational awareness and decision-making. The implementation of centralized data management and real-time monitoring and control capabilities will enable Gas Control personnel and Gas Distribution Operations to more rapidly detect abnormal pressure conditions and take timely corrective action. Specifically, the remote monitoring and control capabilities will allow Gas Control to isolate a DRS in the event of a local abnormal operating condition. These capabilities will also provide a critical monitoring point within the system to more readily identify potential upstream or downstream abnormalities. With this visibility, Gas Control operators can take further system mitigating actions, such as modifying pressure, flow or both, in the affected operating area.

1.2 Rationale (Ratepayer Benefits)

Ratepayers benefit directly from SDG&E's comprehensive business readiness approach, which supports efficient deployment, sustained operability, and long-term effectiveness of deployed technologies. By integrating lessons learned from peer utilities and conducting detailed business process planning, SDG&E minimizes implementation risks and strengthens the value of the investment over its lifecycle.

By prioritizing workforce readiness, which is supported by clear Business Process Designs (BPD) and a dedicated full-scale and operational enhanced Distribution Regulator Station Training Simulator (DRSTS), SDG&E equips field technicians to operate and maintain the enhanced DRSs effectively. This reduces the likelihood of service disruptions, improves response times during abnormal system conditions, and supports safer and more reliable service to customers.

The new technology and associated BPDs enhance Gas Control's situational awareness, supporting quicker identification of pressure anomalies and more timely mitigations. These improvements lower the probability of overpressure events and help avoid safety, operational, and related cost impacts that could otherwise fall on ratepayers.

Together, these business readiness activities support the DRS project in delivering its safety and reliability benefits as efficiently and cost-effectively as possible.

² C124 – Regulator Station Installation, Replacement & Enhancement

2. Organizational Readiness and Business Processes Development

2.1 Business Readiness

To support business readiness for deployment, SDG&E reviewed SoCalGas's implementation experience and incorporated their lessons learned into project planning and execution. While this due diligence enhanced the quality of the design and implementation approach, it did contribute to a delay in the start of DRS enhancement efforts as SDG&E adapted its processes to reflect these insights.

Because SDG&E Gas Distribution will own and execute enhanced DRSs, the project team collaborated closely with business process owners to develop the BPDs. As this work represents a new operational capability for SDG&E, the BPDs were critical in identifying project related needs in training, tooling, communication protocols, and cross-functional coordination. These BPDs established clear roles, responsibilities, and communication pathways between field operations and Gas Control to support long-term operational continuity.

The BPDs further identified the need for a dedicated DRSTS to support field employee proficiency, maintain required operator-qualification standards, and provide ongoing training for new personnel as workforce attrition occurs. The installation of the DRSTS is included in the forecast to support sustained field employee readiness and reliable management of enhanced DRSs.

2.2 Site Selection

Site selection criteria were developed and applied across both SoCalGas and SDG&E, with a focus on safety and reliability. The approach was designed as a risk-informed, adaptable framework—one that could evolve over time as operational insights, field experience, and system knowledge continue to mature. Its purpose has consistently been to minimize the potential for overpressure and under pressure events that could adversely affect public safety or system reliability, consistent with a consequence-of-failure approach. The site selection analysis evaluated DRS operating attributes such as, upstream and downstream pressure conditions, the magnitude of pressure reduction, station throughput, and the size, configuration, and operating profile of the related pressure district.³

As the criteria were applied and experience was gained, refinements were made to better reflect known operational and design differences between the two utilities. These updates were evolutionary in nature and aligned with the original intent of the methodology. The refinements improved applicability and consistency to accommodate the operational system configuration differences between the two utilities. Additional considerations incorporated into the criteria included inlet and outlet pressures, pressure-

³ SCG-06-2R_Chiapa_Hruby_Bell, Appendix E

district size by number of customers served, and inlet pipeline size, which strengthened the analytical framework.

3. Status

3.1 Current State of the Project

SDG&E continues efforts to support effective execution of the DRS project. As of 2026, construction is underway at the first DRS, and work has begun on the DRSTS at SDG&E's Skills Training Center (Skills) to support employee training and readiness. Early program efforts focused on establishing standardized work templates and strengthening project governance and resource alignment, creating a strong foundation for sustained execution. As previously noted, the initiative included a comprehensive BPD effort to map and define new processes aligned with the project's scope. Engineering and design activities commenced as the BPD work neared completion. Given the introduction of new responsibilities across multiple stakeholder groups, the design phase incorporated additional coordination and refinement to provide clarity of roles, operational readiness, and long-term program success.

The project's objective remains consistent with the 2024 GRC authorization: enhancing 20 DRSs with monitoring and remote-control capabilities. The BPDs identified needs in training, tooling, and coordination, which the initiative has now incorporated into the project. The project has incorporated the design and deployment of new training materials, acquisition of necessary tools, and the DRSTS. The DRSTS complements classroom materials by providing field employees with hands-on experience using fully operational equipment in a controlled environment.

3.2 Deployment Schedule

The scope continues to include enhancements at a total of 20 DRSs, consistent with the approved 2024 GRC decision. The project also includes the DRSTS to support technician hands-on training and Operator Qualification (OQ) certification. Enhancements at the 20 DRSs are planned to be completed through 2033. See section 4.4 for details on the enhancement schedule and additional cost per unit details.

4. Capital Cost Methodology

4.1 Overview

The capital cost methodology for the DRS project uses a zero-based forecasting approach for both labor and non-labor costs due to the early stage of the project. Forecasted cost estimates were developed utilizing initial vendor cost estimates and SoCalGas' DRS project cost experience to date and adjusted for known DRS characteristics and system operating differences between SoCalGas and SDG&E.

The forecast methodology uses a unit-cost approach for both labor and non-labor elements.

4.3 Labor Cost Methodology

Labor costs are estimated using a per-unit forecast and are then multiplied by the annual number of enhancements. The estimate includes end-to-end project activities such as project management, planning, permitting, construction, commissioning, and project documentation closeout.

For the year 2026, projected costs are higher than the unit costs shown. This increase reflects one-time expenditures to design and build the DRSTS and implement new business processes for employees who will manage the new equipment and processes. These costs represent a one-time adjustment to the 2026 forecast.

4.3 Non-Labor Cost Methodology

Non-labor costs also use a per unit forecast multiplied by the annual number of enhancements. These costs include contractor labor associated with engineering design, construction and inspection, project execution support, and equipment purchases. For the year 2026, forecasted costs reflect the one-time expenditure to complete the DRSTS, including engineering design, construction, project execution support and equipment purchases. These costs represent a one-time adjustment to the 2026 forecast.

4.4 DRS Enhancement Deployment and Cost Summary

Distribution Regulator Station (DRS) Enhancements					
Unit Count					
	2026	2027	2028	2026-2028 Total	2029 - 2033
Enhanced DRS	1	3	3	7	20
DRS Training Simulator	1	-	-	1	-
Cost Per Unit Breakdown					
Cost Per Site: Project Management & Field Engineering					
COST TYPE	LABOR/NON-LABOR	CLASSIFICATION	DESCRIPTION	COST	
Capital	Labor	Internal Resources	Project Management & Commissioning	\$ 67,500.00	
Capital	Non-Labor	External Resources	Contractor Services	\$ 19,650.00	
Capital	Non-Labor	Materials & Expenses	Travel, Parking, Overnights	\$ 450.00	
Total Unit Cost				\$ 87,600.00	
Cost per DRS Control Site					
COST TYPE	LABOR/NON-LABOR	CLASSIFICATION	DESCRIPTION	COST	
Capital	Labor	Internal Resources	Planning, Permitting, Contracting	\$ 75,000.00	
Capital	Labor	Internal Resources	Inspections	\$ 27,500.00	
Capital	Labor	Internal Resources	Construction & Engineering Oversight	\$ 17,500.00	
Capital	Labor	Internal Resources	Documentation & Close-out	\$ 30,200.00	
Capital	Non-Labor	External Resources	Engineering Design	\$ 194,000.00	
Capital	Non-Labor	External Resources	Mechanical Construction	\$ 350,000.00	
Capital	Non-Labor	External Resources	Electrical & Instrumentation Construction	\$ 110,000.00	
Capital	Non-Labor	External Resources	Inspections	\$ 27,500.00	
Capital	Non-Labor	External Resources	Construction & Engineering Oversight	\$ 17,500.00	
Capital	Non-Labor	Materials & Expenses	Mechanical, Electrical, Instrumentation & Telecommunications	\$ 244,450.00	
Total Unit Cost				\$ 1,093,650.00	
Capital Forecast					
		2026	2027	2028	Total
Labor	Internal Labor	\$435,400.00	\$ 653,100.00	\$ 653,100.00	\$ 1,741,600.00
	External Resources	\$1,437,300.00	\$ 2,155,950.00	\$ 2,155,950.00	\$ 5,749,200.00
Non-Labor	Materials & Expenses	\$ 489,800.00	\$ 734,700.00	\$ 734,700.00	\$ 1,959,200.00
	Total NL	\$1,927,100.00	\$ 2,890,650.00	\$ 2,890,650.00	\$ 7,708,400.00
Total	Total	\$2,362,500.00	\$ 3,543,750.00	\$ 3,543,750.00	\$ 9,450,000.00
Assumptions					
2026 represents the cost for the DRSTS and 1 enhanced DRS					
Deployment schedule consistent with projects requiring specialized planning, permitting, and construction					
DRS projects have a 16-month Engineering, Planning & Permitting duration.					