PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

**ENERGY DIVISION RESOLUTION G-3576**

**DECEMBER 17, 2020**

RESOLUTION

Resolution G-3576 regarding the Southern California Gas Company’s 2020 Compliance Plan and Ratemaking Forecasts for its Natural Gas Leak Abatement Program.

PROPOSED OUTCOME:

* Approves SoCalGas’ 2020 Natural Gas Leak Abatement Compliance Plan and Advice Letter 5603-G-C.

SAFETY CONSIDERATIONS:

* Repairing or replacing pipes and modifying operations and associated infrastructure to reduce methane emissions also advances natural gas pipeline safety.

ESTIMATED COST:

* SoCalGas forecasts a total revenue requirement over the life of the capital projects of $285 million with an annual revenue requirement of $80.588 million for 2021 and $85.026 million for 2022, not including Franchise Fees and Uncollectibles.

By Advice Letter 5603-G and amended filings 5603-G-A, 5603-G-B, and 5603-G-C, which were filed on June 12, June 29, and October 2, respectively.

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**SUMMARY**

This resolution approves Southern California Gas Company’s (SoCalGas) 2020 Natural Gas Leak Abatement (NGLA) Program and Compliance Plan and ratemaking forecasts as filed in Advice Letter (AL) 5603-G-C. The purpose of the NGLA Compliance Plan is to propose how the utility will reduce emissions and implement 26 Best Practices for leak abatement described in the Phase 1 NGLA Program Decision (D.) 17-06-015 and to detail their costs and cost effectiveness. The 2020 Plan is forecasted to achieve substantially more methane abatement and cost less than the 2018 Plan. The funding request detailed in AL 5603-G-C is for $218 million in loaded, escalated 2020 dollars for a total forecasted revenue requirement of $285 million over the life of the capital projects. This includes $266.6 million for Best Practices, $13.5 million for proposed pilots and research and development (R&D), and $4.9 million for program administration costs. The annual revenue requirement for 2021 and 2022 is $80.588 million and $85.026 million respectively, without Franchise Fees and Uncollectibles.

# Background

On September 21, 2014, Senate Bill (SB) 1371 (Leno) was signed into law. SB 1371 authorized the California Public Utilities Commission (CPUC) to adopt rules and procedures to reduce emissions of natural gas from CPUC-regulated gas facilities to the maximum extent feasible.

On September 19, 2016, SB 1383 (Lara) was signed into law. SB 1383 requires the California Air Resources Board, in consultation with the CPUC, to approve and begin implementing a comprehensive strategy by January 1, 2018, to reduce methane emissions by 40 percent by 2030.

On June 15, 2017, the Commission issued Decision (D.) 17-06-015, which directed SoCalGas to submit a Tier 3 AL to establish 2018 and 2019 revenue requirement forecasts and caps for the Natural Gas Leak Abatement program. The AL was to include the incremental costs for each of 26 Best Practices as well as costs for pilot projects and research and development (R&D), broken down by type of expenditure, justifications for the pilot and R&D projects, and the proposed allocation methodology. Ordering Paragraph (OP) 12 states that the ratemaking forecasts and caps that the CPUC approves in response to the Tier 3 ALs shall apply until the NGLA is incorporated into each Utility’s next General Rate Case (GRC) or other gas ratemaking proceeding.

On August 15, 2019, the CPUC adopted a Second Phase Decision, D.19-08-020, establishing additional policies, including requiring use of the utility-proposed standard cost effectiveness methodology and two additional cost-benefit analyses. The decision also imposed a restriction on rate recovery for Lost and Unaccounted For (LUAF) gas beginning in 2025 for SoCalGas and Pacific Gas & Electric if their methane emissions are greater than 20 percent below the 2015 baseline levels[[1]](#footnote-1). This performance objective reflects the CPUC’s intent that SoCalGas and PG&E be at least halfway to achieving the state’s goal of a 40 percent reduction in methane emissions by 2030, consistent with SB 1383.

On October 21, 2019, a Technical Working Group was established to develop guidelines for the NGLA Compliance Plans, and a public workshop was held. The guidelines allow more than one of the 26 Best Practices to be addressed by a combination of actions that may be grouped together in a chapter of the Compliance Plan.

On January 16, 2020, the CPUC voted to modify the GRC plan, adopting an extension of the GRC cycle for each utility from three years to four years and extending SoCalGas’ current GRC through 2023.

On March 12, 2020, SoCalGas submitted AL 5603-G to provide forecasted costs for its 2020 Compliance Plan, including its forecast of costs and emissions reductions for the years 2021 and 2022 and revenue requirements for the life of the capital projects. SoCalGas made various corrections to its initial filing in ALs 5603-G-A, 5603-G-B, and 5603-G-C, which were filed on June 12, June 29, and October 2, respectively.

AL 5603-G-C requests funding of $218 million in loaded, escalated 2020 dollars or a total forecasted revenue requirement of $285 million over the life of the capital projects.[[2]](#footnote-2) The annual revenue requirement for the program is $80.588 for 2021 and $85.026 million for 2022, which results in an overall rate increase of 0.4 percent in both years.[[3]](#footnote-3)

On March 15, 2020, SoCalGas filed its Compliance Plan. The Plan was subsequently amended on June 12 and September 4, 2020. D.19-08-020 authorizes the CPUC’s Safety and Enforcement Division (SED) to approve NGLA Compliance Plans.[[4]](#footnote-4) The authority was transferred to the Safety Policy Division’s Risk Assessment and Safety Analytics Section (SPD staff) upon creation of that new division. SPD staff evaluated the Compliance Plan in consultation with the California Air Resources Board and Energy Division staff, and their complete evaluation is included as Appendix A.

**NOTICE**

Notice of AL 5603-G, 5603-G-A, 5603-G-B, and 5603-G-C were made by publication in the Commission’s Daily Calendar.  SoCalGas states that a copy of the Advice Letter was mailed and distributed in accordance with Section 4 of General Order 96-B.

# PROTESTS

No protests were received.

# DISCUSSION

Energy Division has reviewed SoCalGas AL 5603-G-C as well as SPD staff’s evaluation of SoCalGas’ 2020 Compliance Plan, which was developed in consultation with the California Air Resources Board. SPD and Energy Division recommend approval of SoCalGas’ Compliance Plan and AL 5603-G-C.

SPD staff’s review includes the cost effectiveness methodologies established in D.19-08-020. The standard cost effectiveness measure is the total program cost divided by the total emission reduction for the time period. The total program costs are taken as the Average Annual Revenue Requirement (AARR) times the number of years of the program. From that cost, direct cost savings such as the cost of gas saved are deducted. The net cost is then divided by the cumulative emissions reduction and expressed in dollars per thousand standard cubic feet of natural gas emissions or $/MCF.[[5]](#footnote-5)

This is the first time the additional two cost-benefit tests have been used in the Compliance Plans: the avoided Cap and Trade compliance costs and the avoided Social Cost of Methane. As specified in D.19-08-020, the avoided Cap and Trade cost is based on the reduction in gas throughput caused by abating leaks and assumes that all gas throughput would have been combusted to carbon dioxide (CO2) and emitted to the atmosphere.[[6]](#footnote-6) To estimate the value of reduced Cap and Trade compliance costs, SoCalGas assumed a December 2022 vintage futures value based on the five-day average of trading days January 10-16, 2020, from the International Exchange. Use of that value results in a Cap and Trade benefit of $1.14 per MCF.

The benefit of the avoided Social Cost of Methane is the future cost to society from the environmental impact of methane, which has a higher global warming potential in the short term than CO2. D.19-08-020 provides a value of $21/MCF for the Social Cost of Methane for use in the utilities’ Compliance Plans. These two additional tests are to be used for information and comparison purposes.[[7]](#footnote-7)

When the benefits of Cap and Trade and Social Cost of Methane are subtracted from the standard cost effectiveness methodology, they have the effect of increasing the cost effectiveness of the program by lowering its cost relative to its benefits. Where net negative benefits result, it means the Best Practice saves more than it costs. It is important to note that while D.19-08-020 required these three tests, it specifically states “…we do not adopt a requirement that all measures, or the Compliance Plans in their entirety, must show a positive benefit to cost ratio under either methodology. The CPUC retains full discretion to evaluate measures proposed in the Compliance Plans considering cost-effectiveness along with other qualitative factors and policy goals.”[[8]](#footnote-8)

SPD staff’s evaluation of SoCalGas’ Compliance Plan shows that a number of the Best Practices are very cost effective. Blowdown Activities show a net *negative* cost effectiveness of -$3/MCF. Increased Leak Surveys/Intervals show a net cost-effectiveness (including benefits of Cap and Trade and Social Cost of Methane) of $4/MCF. A number of the Best Practices, such as Aerial Surveys, are too new to have estimated emissions reductions or are Best Practices necessary for the implementation of the program (such as recordkeeping, information technology, training, and digitalization). In addition, new measures such as Aerial Surveys of SoCalGas’ large service territory may identify gas leaks downstream of SoCalGas facilities that might otherwise not be identified and repaired quickly. SoCalGas plans to notify responsible parties of these leaks. While SoCalGas cannot claim credit for the reduced emissions that may result from remediation of these downstream leaks in its Compliance Plan, this practice clearly supports the State of California’s overall goals to reduce methane emissions, and as more data is provided, continuation and proper crediting of the practice can be evaluated.

The 2020 Plan is forecasted to achieve substantially more methane abatement and cost less than the 2018 Plan. The funding request for the program throughout the useful life of the measures is for $218 million[[9]](#footnote-9) in loaded, escalated 2020 dollars as opposed to the $234 million approved for the 2018 Plan. The loaded cost estimates include a 10 percent contingency, which is a decrease from the 20 percent contingency factor included in the 2018 Compliance Plan. Contingency factors are typically used for implementation of new practices whose costs are difficult to estimate. The contingency was reduced in the 2020 Plan because some of the costs now have historical data on which to base forecasts. In the event that the 10 percent factor is too high, actual costs are being recorded in Balancing Accounts, and unspent funds will be refunded to ratepayers.

Annual emission reductions are estimated to be nearly 500,000 MCF, achieving an 18 percent reduction from SoCal Gas’ 2015 emissions by 2030. While this does not meet the program’s goal of a 20 percent reduction by 2025, nor a 40 percent emissions reduction by 2030, the 2015 baseline is expected to be adjusted in the future due to improved measuring techniques. Further, until new emission tracking methods are implemented, approximately 60 percent of SoCalGas’ emissions are estimated based on population, facility, or component-based emission factors. Until emissions are more accurately measured, the estimates are not verifiable. SoCalGas is also forecasting annual reductions from behind-the-meter customer activities that will not count towards the reduction in emissions because behind-the-meter reductions were not measured in the baseline.

The annual revenue requirement of $80.588 million and $85.026 million for 2021 and 2022 respectively results in an overall increase of 0.4 percent for both years in the overall Natural Gas Transportation Rate. This change will be allocated across customer classes using the Equal Percent of Authorized Margin method, which allocates the balance in an account across customer classes according to each customer class’ share of the total GRC base margin allocated to that customer class. The distribution of rate increases across customer classes is shown in Attachment A. If, as expected, SoCalGas files its 2020 Annual Consolidated Rate Update showing a $35 million underspend in its NGLA balancing accounts, that will offset the forecasted 0.4 percent increase leading to a decrease of -0.5 percent in the Natural Gas Transportation Rate effective January 1, 2021 as shown in Attachment A.

The CPUC has reviewed SoCalGas ALs 5603-G, 5603-G-A, 5603-G-B, and 5603-G-C and finds the proposed rate changes for the Natural Gas Leak Abatement program in AL 5603-G-C to be reasonable.

# COMMENTS

This is an uncontested matter in which the resolution grants the relief requested. Accordingly, pursuant to Public Utilities Code 311 (g)(2), the otherwise applicable 30-day period for public review and comment is being waived.

# FINDINGS

1. On September 21, 2014, Senate Bill (SB) 1371 (Leno) was signed into law. SB 1371 authorized the California Public Utilities Commission (CPUC) to adopt rules and procedures to reduce emissions of natural gas from CPUC-regulated gas facilities to the maximum extent feasible.
2. On September 19, 2016, SB 1383 (Lara) was signed into law. SB 1383 requires the California Air Resources Board, in consultation with the CPUC, to approve and begin implementing a comprehensive strategy by January 1, 2018, to reduce methane emissions by 40 percent by 2030.
3. Decision (D.) 17-06-015 and D. 19-08-020 ordered ratemaking forecasts for the Natural Gas Leak Abatement Program to be submitted in Tier 3 Advice Letter (ALs).
4. Ordering Paragraph 12 of D.17-06-015 states the ratemaking forecasts and caps that the CPUC approves in response to the Tier 3 ALs shall apply until the Natural Gas Leak Abatement Program is incorporated in each Utility’s next General Rate Case (GRC) or other gas ratemaking proceeding.
5. D.19-08-020 established additional policies, including requiring use of the utility-proposed cost effectiveness methodology and two additional cost-benefit analyses: the benefit of reduced Cap and Trade compliance costs and the benefit of the avoided Social Cost of Methane. These two additional tests are to be used for information and comparison purposes.
6. D.19-08-020 imposed a restriction on rate recovery for Lost and Unaccounted For (LUAF) gas for SoCalGas and Pacific Gas & Electric beginning in 2025 if their methane emissions are greater than 20 percent below the 2015 baseline levels. This performance objective reflects the CPUC’s intent that SoCalGas and PG&E be at least halfway to achieving the State’s goal of a 40 percent reduction in methane emissions by 2045, consistent with SB 1383 and SB 1371.
7. On October 21, 2019, a Technical Working Group was established to develop guidelines for the NGLA Compliance Plans, and a public workshop was held. The guidelines allow more than one of the 26 Best Practices to be addressed by a combination of actions that may be grouped together in a chapter of the Compliance Plan.
8. Staff from Safety Policy Division’s Risk Assessment and Safety Analytics section (SPD staff) has completed evaluation reports on SoCalGas’ Compliance Plan in collaboration with the California Air Resources Board.
9. SPD staff may direct the utilities to discontinue any project that is determined to be no longer in the ratepayers’ interest.
10. SPD staff, in consultation with staff of the California Air Resources Board, approves adoption of SoCalGas’ Compliance Plans.
11. Energy Division has reviewed SoCalGas ALs 5603-G, 5603-G-A, 5603-G-B, and 5603-G-C as well as SPD staff’s evaluation of SoCalGas’ 2020 Compliance Plan. Energy Division recommends approval of SoCalGas’ Compliance Plan and AL 5603-G-C.
12. SoCalGas’ 2020 Plan is forecasted to achieve substantially more methane abatement and cost less than the 2018 Plan.
13. Annual emission reductions are estimated to be nearly 500,000 MCF, achieving an 18 percent reduction from SoCal Gas’ 2015 emissions by 2030. While this does not meet the program’s goal of a 20 percent reduction by 2025, nor a 40 percent emissions reduction by 2030, the 2015 baseline is expected to be adjusted in the future due to improved measuring techniques.
14. The annual revenue requirement is $80.588 million and $85.026 million for 2021 and 2022 respectively, not including Franchise Fees and Uncollectibles.
15. The total funding request is $218 million in loaded, escalated 2020 dollars with a total forecasted revenue requirement of $285 million over the life of the capital projects.

**THEREFORE IT IS ORDERED THAT:**

1. The request of Southern California Gas Company (SoCalGas) regarding its Natural Gas Leak Abatement Program Compliance Plan and forecast as filed in Advice Letter 5603-G-C is approved with a total forecasted revenue requirement of $285 million for the total revenue requirement over the life of the capital projects. The annual revenue requirement is $80.588 million for 2021and $85.026 million for 2022, not including Franchise Fees and Uncollectibles.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on

December 17, 2020; the following Commissioners voting favorably thereon:

*/s/ Rachel Peterson*

RACHEL PETERSON

Acting Executive Director

MARYBEL BATJER

President

LIANE M. RANDOLPH

MARTHA GUZMAN ACEVES

CLIFFORD RECHTSCHAFFEN

GENEVIEVE SHIROMA

Commissioners

ATTACHMENT A

Proposed Changes to Natural Gas Transportation Rate Allocations across Customer Classes for 2021 and 2022 with Potential Rate Decrease for 2021







ATTACHMENT B

Safety Policy Division’s Evaluation of Southern California Gas Company’s

2020 Natural Gas Leak Abatement Compliance Plan

**Safety Policy Division**

**Risk Assessment and Safety Analytics Section**

**Staff Evaluation**

**Southern California Gas Company 2020 Natural Gas Leak Abatement Compliance Plan**

EXECUTIVE SUMMARY

The Risk Assessment and Safety Analytics (RASA) Staff of the CPUC Safety Policy Division (SPD), in consultation with the California Air Resources Board (CARB), approves the proposed emissions reduction measures set forth in the Southern California Gas Company (SoCalGas) Amended 2020 Natural Gas Leak Abatement (NGLA) Compliance Plan, filed on September 4, 2020. The Plan demonstrates how SoCalGas intends to comply with [Decision (D.) 19.08-020](https://pucvpn213.cpuc.ca.gov/dana/home/index.cgi).

In the 2020 Plan, emissions reduction measures approved in the 2018 Plan are proposed to continue, along with new activities based on research and pilot projects completed in the 2018-2019 period. While the cost effectiveness of each proposed measure varies, those that have a higher cost effectiveness ratio tend to have a lower absolute cost and provide additional safety benefits. Reduced emissions also provide Cap and Trade cost savings and social cost of methane benefits, ultimately making these measures more affordable.

This SoCalGas 2020 Compliance Plan projects an annual estimated emissions reduction of approximately 500,000 thousand cubic feet (MCF) by 2030, an 18 percent reduction from the original 2015 Baseline based on the current methods of estimating emissions.[[10]](#footnote-10) This estimate falls short of the statewide goal of 40 percent. However, recent improvements in measurement techniques and system knowledge developed as a result of research and pilot projects are expected to improve the accuracy of the original baseline and reported emission values. These changes are expected to reduce the baseline level and allow for more accurate measurement of actual reductions achieved, so that the percentage reduction reported will increase.

A unique feature of the 2020 Plan is the reduction of emissions downstream of SoCalGas facilities, beyond the meter. These emissions occur on customer piping and facilities, not on SoCalGas assets, yet the company proposes to identify downstream leaks for resolution by the customers, contributing to the overall greenhouse gas reduction goal.

RASA Staff approves[[11]](#footnote-11) adoption of the SoCalGas Plan as proposed.

BACKGROUND

In accordance with Decision (D.) 19.08-020, which established Phase II in the CPUC’s proceeding to address Senate Bill (SB) 1371[[12]](#footnote-12), SoCalGas filed a Compliance Plan as required on March 15, 2020. After initial feedback by RASA Staff, SoCalGas submitted an amended plan on June 12, 2020, which was further amended on September 4, 2020. The purpose of the NGLA Compliance Plan is to propose how the utility will achieve emissions reductions, primarily though implementation of the Best Practices for leak abatement described in the Phase I NGLA Program Decision (D.) 17-06-015.

The Risk Assessment and Safety Analytics (RASA) Section of the Safety Policy Division, originally part of the Safety Enforcement Division (SED), has monitored and evaluated the NGLA Program since the initial plans were submitted in 2018. Based on the RASA evaluation of those plans, the Commission voted to adopt Resolution G-3538 in October 2018 authorizing the collection of funds from ratepayers in Memorandum and Balancing Accounts to permit implementation of the 2018 Compliance Plan in 2019 and 2020.

The Phase II Decision added requirements for the Compliance Plans, including specifications for determining the cost effectiveness for each proposed compliance measure, when emissions reduction can be attributed to the measure. D.19.08-020 requires use of a specified cost-effectiveness methodology and two cost-benefit analyses to provide benefit information when evaluating proposed methane reduction measures and for evaluating the Biennial Methane Leaks Compliance Plans (Compliance Plans), while maintaining full discretion for the Commission to also consider qualitative factors and policy goals. The two cost-benefit analysis are: Cap and Trade savings and avoided social cost of methane. D.19.08-020 did not specify a cost effectiveness threshold but required the proposals to be evaluated on qualitative and quantitative bases.

Some of the best practices such as record-keeping or training do not have directly associated emissions reductions; rather these practices serve as foundational support for the overall goal. The Phase II Decision also provides for grouping multiple Best Practices into integrated measures, with each measure described in its own Chapter.

APPROVAL AUTHORITY

D.19.08-020 authorizes the CPUC’s SED to approve NGLA Compliance Plans.[[13]](#footnote-13) Since the Decision was issued, the SED RASA Staff who had that responsibility are now part of the Safety Policy Division and have continued that role. When funding is required outside of a General Rate Case (GRC), the utility will file a Tier 3 Advice Letter with Energy Division, which requires a Resolution to be voted on by the Commission.

COMPLIANCE PLAN SUMMARY

The SoCalGas Amended 2020 Compliance Plan presents a total of 28 Chapters detailing measures to address the 26 Best Practices to begin or continue in 2021. Nine Chapters provide an emissions reduction estimate with corresponding cost effectiveness values .Overall, the Plan projects emissions reduction of 18 percent by 2025 from the unadjusted 2015 baseline, with no additional reduction expected by 2030. This estimate falls short of both the statewide greenhouse gas (GHG) reduction goal of 40 percent by 2030 and the interim reduction target of 20 percent by 2025 established in the Phase II Decision.

However, as noted in the Decision, approximately 60 percent of the baseline emissions level and subsequent reported emissions are estimated from population-based emission factors, which rigidly link emission volumes to the number of devices or miles of pipeline in the operator’s system rather than measurement of actual leaks. Thus, no reduction from those sources can be measured unless better quantification methods are employed. Research and pilot studies aimed at developing such quantification methods have been conducted in the last two years, which have been presented by SoCalGas and PG&E at the annual NGLA winter workshops for consideration by RASA and California Air Resources Board (CARB) Staff.

RASA Staff expects that these improved methods should provide a better measurement of the performance of SoCalGas’s initiatives and will better inform decisions about potential corrections in future Compliance Plans as may be needed to reach the 2030 goal.

A summary table of the chapters offering emissions reduction estimates and cost effectiveness values follows in Appendix A, Table 2. Each of these chapters will be examined in Section A below.

COST EFFECTIVENESS

D.19.08-020, the Phase II decision, defined a cost effectiveness calculation method and requires presentation of the social cost of methane and Cap and Trade benefits.

STANDARD COST EFFECTIVENESS

The “standard” cost effectiveness is the total program costs divided by the total emissions reduction for the same time period. Total NGLA program costs are taken as the Average Annual Revenue Requirement (AARR) times the number of years of the program. From that cost, direct cost savings such as the cost of gas saved are deducted. This net cost is then divided by the cumulative emissions reduction. Cost effectiveness is expressed in dollars per thousand standard cubic feet of natural gas emissions or $/MCF.

CAP AND TRADE BENEFITS

An avoided Cap and Trade cost analysis is required by D. 19-08-020, to be used for information and comparison purposes.[[14]](#footnote-14) For SoCalGas, an annual Advice Letter forecasts the rate impact of the Cap and Trade expense. This expense is added to rates per CPUC approval. Emissions reductions are accounted for in this Advice Letter as reduced gas throughput. In the Compliance Plan, the utility is required to show the value of the avoided Cap and Trade cost as a benefit in $/MCF. The Decision specifies that the Cap and Trade cost benefit test shall use the same Emission Conversion Factor and Proxy Greenhouse Gas Allowance Price as is used for the gas utilities’ forecast revenue requirements pursuant to Decision 15-10-032.[[15]](#footnote-15) That decision values Cap and Trade costs on the basis that all gas throughput is combusted to carbon dioxide and emitted to the atmosphere as CO2.

This is the first time these tests have been included in the Compliance Plans. RASA found an error in SoCalGas’ original Plan: the utility assumed that the benefit should represent the Global Warming Potential (GWP) of avoided methane emissions, which have a higher value than emitted CO2. However, that approach does not comply with D.19.08-020. Staff notes that the GWP of methane is allowed for in the social cost of methane benefit. SoCalGas corrected the error in the Amended Plan submitted on September 4, 2020.

The Proxy Greenhouse Gas Allowance Price is variable based on market valuation. To determine the Cap and Trade benefit for the Compliance Plan, SoCalGas used a December 2022 futures value based on the five-day average of trading days January 10-16, 2020 from the International Exchange: $20.82 per metric ton CO2 equivalent (MT CO2(e)). That price combined with the Emission Conversion Factor of 54.64 MT CO2(e) per one million cubic feet of natural gas throughput gives a Cap and Trade benefit of $1.14/MCF of natural gas, significantly lower than the original SoCalGas figure of $13.61/MCF. RASA Staff agrees with the revised SoCalGas determination.

SOCIAL COST OF METHANE BENEFITS

The second cost-benefit test required by Phase II is the value for avoided social cost of methane (SCM). While not an immediately tangible savings to the ratepayer, the future cost to society from the environmental impact of GHGs is an important component of any GHG program. The Phase II Decision provides an SCM value of $21/MCF to use in Compliance Plans.[[16]](#footnote-16) SoCalGas used that value in the Plan.

REVIEW OF PLAN CHAPTERS

A complete list of all chapters with their Average Annual Revenue Requirement, Cost Effectiveness, and Best Practices (BPs) addressed, is provided in Table 1 below. This report first examines the chapters that present estimated emissions reductions and cost effectiveness values in Section A and the remaining chapters in Section B.

Staff notes that BPs 1, 8, 10, and 14 were not specifically addressed in the Plan. BP 1 is the requirement to have a Compliance Plan, which is manifestly fulfilled. In the Plan Introduction, SoCalGas does mention that BPs 8,10, and 14 had been addressed in the 2018 Plan so do not require additional discussion. A description of all 26 Best Practices is provided in Appendix B for reference.

**TABLE 1. COMPLIANCE PLAN SUMMARY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CHAPTER** | **DESCRIPTION** | **Avg. Ann. Revenue Reqt., Millions** | **Cost Effectiveness, $/MCF** | **Best Practices Addressed** |
| 1 | Leak Inventory Reduction (Find-It, Fix-It) | $23.80 | $78 | 21 |
| 2 | Increased Leak Survey Frequency1 | $5.00 | $38 ($26) | 15, 16 |
| 3 | Blowdown Reduction-Pipelines | $1.60 | $19 | 23, 3-7 |
| 4 | Large Leak Prioritization | $1.40 | $73 | 15, 16, 20a, 21 |
| 5 | Damage Prevention Analytics | $2.20 | $233 | 24, 25, 26 |
| 6 | Advanced Meter Analytics | $0.27 | $5 | 17 |
| 7 | Recordkeeping IT | $11.40 | NA | 9 |
| 8 | Geographic Tracking (IT Digitization) | $7.90 | NA | 9, 20b |
| 9 | Training, Competency Based | $1.90 | NA | 13 |
| 10 | Training, Facility Enhancement | $0.14 | NA | 13 |
| 11 | Blowdown Reduction at Storage Facilities | $1.30 | NE | 23 |
| 12 | Stationary Methane Detection | $0.64 | NA | 18 |
| 13 | Electronic Leak Survey (GIS Tracking) | $2.10 | NA | 20b |
| 14 | Aerial Monitoring2 | $11.30 | $130 | 15, 16, 20a, 21 |
| 15 | Damage Prevention Public Awareness | $1.50 | NE | 24, 25, 26 |
| 16 | Pipe Fitting Specifications | $1.20 | NE | 22 |
| 17 | Repeat Offender Damage Prevention | $0.86 | NE | 26 |
| 18 | Meter Calibration Factor3 | $0.02 | negative | 23 |
| 19 | Gas Speciation (Methane Detection) | $0.24 | NE | 17 |
| 20 | Public Leak Maps | $0.05 | NE | 20b |
| 21 | Methane GHG Policy | none | NA | 2 |
| 22 | Vapor Collection (Blythe Compressor)4 | none | NA | 23 |
| 23 | Differential Pressure Testing | none | NA | 23 |
| 24 | Above Ground Survey-Distribution | none | NA | 19 |
| 25 | Above Ground Survey-Storage | $1.50 | NE | 19, 21 |
| 26 | Training- Methane Emissions | none | NA | 11, 12 |
| 27 | Leak Repair -Distribution Above Ground | none | NA | 19, 21 |
| 28 | High Bleed Device Replacement | none | NA | 23 |
|  |  |  |  |  |
| **TOTAL** |  | **$76.32** |  |  |

**NA =** Cost Effectiveness not applicable. **NE =** Emission reduction could not be estimated.

1 AARR includes a one-time charge to re-arrange, or ‘levelize’ leak survey maps. The cost effectiveness without this charge is $26/MCF. With the charge it is $38/MCF.

2 The aerial survey costs include measurement of downstream gas facilities, and costs to employ additional personnel to investigate the downstream leak indications.

3 There is a large cost benefit of $34 million over three years of savings from avoiding meter replacement, and a low revenue requirement to implement the measure. Thus, cost effectiveness is a large negative number, which indicates a cost savings.

4 The vapor recovery equipment at Blythe Station has been recently installed and paid for from the 2018 Compliance Plan, so there is no cost effectiveness value provided. The expected emission reduction is 12,614 MCF per year.

SECTION A. EVALUATION OF CHAPTERS WITH REDUCTION ESTIMATES

RASA staff reviewed the following chapters in order of estimated reductions, from greatest to least. Estimated emissions reductions and Cost Effectiveness for these chapters are summarized in Table 2 in Appendix A.

CHAPTER 1. LEAK INVENTORY REDUCTION

This chapter addresses one of the fundamental concerns of SB 1371 and the NGLA program: gas leaks allowed to remain open indefinitely. Prior to the NGLA program, leaks that were not defined as hazardous by safety regulations did not have to be repaired promptly; these leaks (typically referred to as Grade 3) were too low in gas concentration to support ignition. Now under the NGLA program, Best Practice 21 (“Find it, Fix it’) requires all leaks to be repaired as soon as possible but no more than three years after discovery, with some exceptions for unusually high cost repairs.

The estimated emissions reductions for this chapter, 240,769 MCF by 2025, is the largest of all the proposed measures in the Compliance Plan and amounts to about half of the total reductions. SoCalGas intends to reduce the leak inventory period to 18 months at first, and then to six months. The sooner a leak is repaired, the lower the resultant emissions. Six months is considered a practical limit due to permitting and other construction limitations. The chapter incorporates the current leak inventory as well as new additional leaks to be discovered by more frequent leak surveys in accordance with Best Practice 15 (Leak Survey Interval) and 16 (Special Leak Surveys).

The standard Cost Effectiveness is presented as $78/MCF based on an AARR of $23.8 Million. This value compares favorably with the 2018 Compliance Plan estimate of $138/MCF for leak backlog reduction. The Cap and Trade benefit is approximately $1.14/MCF. The social cost of methane benefit as provided in the Phase II NGLA Decision[[17]](#footnote-17) is $21/MCF. The net cost effectiveness is $56/MCF.

Once the outstanding inventory of leaks is eliminated by repair, there will not be a backlog. SoCalGas projects the Chapter’s work will end by 2025.

RASA Staff approves adoption of the Chapter 1 measures.

CHAPTER 2. INCREASED LEAK SURVEY FREQUENCY

This chapter incorporates Best Practice 15 (Leak Survey Interval) and 16 (Special Leak Surveys). BP 15 requires a three-year leak survey period or an alternative survey period if more effective in special cases. SoCalGas plans to continue with the alternative annual leak surveys as approved in the 2018 Plan for two types of pipe material known to be leak-prone: unprotected steel and pre-1986 vintage Aldyl-A plastic pipe.

Unprotected steel pipe means that no anti-corrosion system, such as cathodic protection, is installed on that pipe. Aldyl-A, one of the earliest forms of plastic pipe used instead of steel, has been found to develop leaks more often than other materials. The older, “vintage,” supplies of Aldyl-A are particularly subject to developing leaks.

Emissions reduction achieved in 2018 after one year of annual surveys performed on pre-86 Aldyl-A was 39,903 MCF, compared with the forecasted reduction of 16,749 MCF. That practice was begun under SoCalGas’ regulatory Distribution Integrity Management Program (DIMP) and is a good example of what can be achieved with increased leak survey intervals. RASA staff note that the pre-86 Aldyl-A survey is funded under the General Rate Case as a DIMP-related program.

For the leak survey frequency measures in Chapter 2, the expected reduction by 2025 is 133,017 MCF, the second-largest contributor to reductions.

The standard cost effectiveness is presented as $26/MCF based on an AARR of $3.7 million. SoCalGas excluded a one-time cost which is needed to re-configure, or “levelize,” the company’s leak survey maps to support the change in survey frequency. With this one-time charge included the AARR is $5 million, which makes the Cost Effectiveness $38/MCF. Either way, it is among the lower cost effectiveness values of all the proposed measures. By comparison,the 2018 Compliance Plan estimated a cost effectiveness of $34/MCF for annual surveys on unprotected steel.

This cost effectiveness calculation does not include the cost of the GRC-funded pre-86 Aldyl-A surveys since that is already paid for to comply with DIMP regulations, but it does include the emissions reduction expected from the pre-86 Aldyl-A surveys.

Additional cost-benefit analysis was provided for Cap and Trade and social cost of methane savings. These values are the same for all programs at $1.14 and $21 per MCF, respectively. The net cost effectiveness with those benefits drops from $26/MCF to $4/MCF.

RASA Staff approves adoption of the Chapter 2 measures.

CHAPTER 3. BLOWDOWN REDUCTION ACTIVITIES

Another set of BPs involve reduction of intentional gas releases, usually for maintenance purposes, known as blowdowns. This chapter implements BPs 3, 4, 5, 6, 7, and 23. These practices include such activities as bundling of several projects, reducing pressure before the blowdown, and containing the emissions with portable compressors.

Estimated emissions reduction by 2025 is 94,317 MCF, about 20 percent of the total reductions expected. It should be noted that the number of blowdowns can vary up or down from year to year as different maintenance activities may dictate. Staff expects the general trend will be an emissions reduction as estimated by SoCalGas.

Cost effectiveness for this chapter is given as $19/MCF based on an AARR of $1.6 million, which is a lower cost per cubic foot than the two previous chapters. When the cost benefits of Cap and Trade and social cost are included, this chapter has a net negative cost effectiveness of

$19 - $22 = -$3/MCF. In other words, it produces cost savings of $3/MCF.

RASA Staff approves adoption of the Chapter 3 measures.

CHAPTER 14. AERIAL SURVEY

This chapter presents a novel approach to both discovering and quantifying leaks. An aerial-based methane sensing device would be flown over the approximately 18,000 miles of gas mains in service territories that are not scheduled for a standard foot survey in each year. SoCalGas reports that this Gas Mapping LiDAR (GML) technology was demonstrated successfully in a pilot program carried out in 2019. This chapter addresses Best Practice 17 “Enhanced Methane Detection” and BPs 15, 16, 20a and 21.

At the start of the new Compliance Plan period in 2021, gas leak indications, and the volume of the leaks, will be measured with new technology not currently employed by SoCalGas in leak surveys. LiDAR, an acronym for Light Detection and Ranging, is based on airborne laser light interacting with the ground surface and gases which may interfere with the light. SoCalGas conducted a pilot study with a third-party company that has developed a way to use LiDAR to find and quantify natural gas leaks. This method has an advantage in identifying “super-emitters,” i.e., quantifiably large leaks, which provide greater emissions reduction when identified and repaired quickly. The GML technology has been developed through testing at the Colorado State University Methane Emissions Test and Evaluation Center (METEC) facility, which RASA staff has visited.

As an additional benefit, the aerial survey would find gas leaks downstream of SoCalGas facilities that might otherwise not be reported and repaired quickly, such as leaks at large industrial sites as well as residential house lines. This method can reduce greenhouse gas emissions beyond those originating from gas company pipes. To support the follow-up investigations of these downstream leak indications, SoCalGas requires 16 additional employees, whose salaries are included in the chapter costs. Repair costs would be the responsibility of the downstream gas facility owners.

The expected volume of emissions reduction resulting from the aerial surveys in the first year, 2021, is approximately 85,000 MCF. SoCalGas states they cannot estimate future year reductions based on the pilot study, but potential reductions from downstream facilities, which are not under CPUC regulation for emissions, could be significant. The greatest portion of the costs is for the aerial survey contractor, given at $6.8 million per year to cover 2,200 square miles.

RASA Staff expects that as more experience is gained from this approach, better data about actual emissions reduction will be developed, and continuation can be reviewed in the future Compliance Plans. The chapter addresses the overall statewide goal of methane emissions reduction, extending beyond the gas company facilities.

The standard cost effectiveness is presented as $130/MCF. Cap and Trade savings and social cost of methane provide approximately $22/MCF of combined benefits for a net cost effectiveness of $108/MCF.

RASA Staff approves adoption of the Chapter 14 measure.

CHAPTER 6. ADVANCED METER ANALYTICS

Chapter 6 is aimed at reducing downstream emissions occurring on customer house lines and other user facilities. The measure would apply advanced analytics to customer usage data from smart meters to determine unusually high usage, which can indicate a possible downstream gas leak. A pilot program was conducted on a daily sampling bases, which SoCalGas now proposes to increase to hourly sampling.

While the Plan associates this measure with BP 17 “Enhanced Methane Detection,” it is not related to the description of that BP, which is that “Utilities shall utilize enhanced methane detection practices (e.g. mobile methane detection and/or aerial leak detection) including gas speciation technologies.” Regardless, RASA Staff recognize that this chapter offers additional emissions reduction. The Decision does not prevent utilities from adopting other practices in pursuit of the emissions reduction goal.

The cost effectiveness is presented as $5/MCF for an expected reduction of 37,000 MCF in 2021. SoCalGas could not forecast additional reductions in future years. The additional cost-benefits of Cap and Trade and social cost of methane add up to $22/MCF, for a net negative cost effectiveness: -$17/MCF. In other words, there is a cost savings of $17/MCF.

RASA Staff approves adoption of the Chapter 6 measure.

CHAPTER 5. DAMAGE PREVENTION ALGORITHM

Third-party damage to gas pipes often results in hazardous gas emissions. Damage prevention programs, such as “Call Before You Dig,” reduce the chance of many potential dig-ins by giving contractors the opportunity to dial 811, which gives utility operators notification to mark the locations of buried pipelines in the construction zone. Yet dig-ins still occur as some excavation contractors fail to participate. The chapter addresses the Dig-In Best Practices 24, 25, and 26.

Chapter 5 proposes a software-based algorithmic analysis of construction permits that are likely to include excavations in conflict with buried pipelines but do not have an accompanying 811 dig ticket. This data analytic approach will allow SoCalGas to reach out to these contractors and make sure they are aware of buried gas pipelines in the work area before damage can occur.

SoCalGas conducted a pilot study in 2019 with a third-party data-analytics supplier to establish the expected emissions reduction potential. For full implementation, SoCalGas evaluated whether they could develop the software themselves or purchase it from the vendor and found it more cost effective to develop in-house.

The emissions reduction estimate is 7,068 MCF in the first year, 2021. Beyond the first year, experience with the method will allow estimation of additional reductions. The chapter proposes nine new employees to cover a portion of the service territory: six damage prevention analysts, one data scientist, and two technical advisors. Additional personnel may be considered in future years to expand service territory coverage as experience may suggest.

While the cost effectiveness ratio is high at $233/MCF, the average annual revenue requirement is $2.2 million, a small part of the total NGLA program cost. The avoided repair cost of damaged pipe is expected to save $1.1 million in the first two years and is included as a cost benefit in the cost effectiveness figure. The benefits of Cap and Trade and social cost of methane reduce the cost effectiveness to $211/MCF..

This chapter has the additional benefit of reducing the safety risk of gas released under pressure during construction work. Ignition of gas from a broken pipe is a serious hazard to people and property in the vicinity, which can result in death and injury as well as disruption of business and traffic until the repair is made.

RASA Staff approves adoption of Chapter 5.

CHAPTER 28. HIGH BLEED DEVICE REPLACEMENT

Best Practice 23 requires the replacement of mechanical devices that are designed to “bleed” a high flow of gas to the atmosphere continuously. These devices are usually older gas pressure control units that can be replaced by more modern low- or no-bleed designs. Replacement of these devices has been on-going and will be completed by 2021.

SoCalGas estimates an emissions reduction of 1,500 MCF by 2021, when they expect that all remaining high-bleed devices will be replaced. No additional funding will be required to complete this work, so no cost effectiveness was provided for this chapter.

RASA Staff approves adoption of Chapter 28.

CHAPTER 18. METER CALIBRATION FACTOR

This chapter addresses Best Practice 23: Minimize emissions from operations, maintenance, and other activities. When a customer gas meter goes out of calibration, the traditional remedy is to remove and replace the meter, which produces an estimated one cubic foot of gas emission per meter during the replacement process. In the 2018 Plan, SoCalGas received approval to adjust the meter calibration billing factor instead of replacing the meter.

Chapter 18 proposes to continue the program of calibration adjustment for approximately 74,000 meters known to require remediation. The cost is estimated at only a portion of one employee’s labor in 2021: an AARR of about $19,000. There is a modest emission savings of 74 MCF but a large cost savings of $34 million through 2022 from not having to replace the meters. SoCalGas did not provide a cost effectiveness value since it would be a large negative number, indicating cost savings. The program pays for itself many times over. The cost savings will help offset the costs of other emissions reduction measures.

RASA Staff approves adoption of Chapter 18.

CHAPTER 23. DIFFERENTIAL PRESSURE TESTING

In accordance with Best Practice 23, this chapter attributes emissions reduction of five MCF per year to a customer meter test method approved in the 2018 Plan. This measure replaced a mandatory test for rotary gas meters, which opened service piping and released gas to the air. The differential pressure test does not disconnect gas piping, so no emissions are produced.

The measure was funded in the 2018 Plan, so no cost effectiveness value was provided. RASA Staff notes that total one-time costs are reported as $348,999 while operational savings is about $299,000 a year. So, the project paid for itself in just over one year. RASA approved this measure in the 2018 Plan.

CHAPTER 4. LARGE LEAK PRIORITIZATION

Identification of large leaks (“super emitters”) in terms of gas volume allows prioritized repair of the larger contributors to emissions. SoCalGas has developed a method for ground-based leak survey technicians to identify leaks that have a high likelihood of being large, which then triggers a confirmatory quantification measurement and prioritization of repair. The chapter addresses Best Practice 20a, Quantification, as well as BPs 15, 16, and 21.

An estimated emissions reduction of 54,546 MCF is only given through 2022 since the company expects the backlog of large leaks will have been identified and repaired by then. Future large leak reductions are expected to show up in the overall leak reduction efforts of increased survey frequency and Find-It, Fix-It practices.

Cost Effectiveness is presented as $73/MCF. Total revenue requirement is $3.4 million.

RASA Staff approves adoption of Chapter 4.

SECTION B. REVIEW OF CHAPTERS WITHOUT REDUCTION ESTIMATES

Some of the chapters address those required Best Practices to which no emissions reduction can be directly assigned. Rather, they are either foundational practices that support the reduction goal, or there was insufficient data from which to estimate an emissions reduction.

RASA reviewed all chapters for compliance with Best Practices. Those chapters that require new funding in this Compliance Plan cycle are reviewed below.

CHAPTER 7. RECORDKEEPING IT

This chapter addresses Best Practice 9 and continues an Information Technology program approved in the 2018 Plan to bring all data records needed for leak management, reporting, and emissions reduction into an integrated digital system.

The chapter details five major measures, including digitization of paper forms, creating a “data lake” for digital record storage, support for engineering data analytics and performance optimization, field verification of asset data, real-time data management for leak abatement, and development of mobile, digital field forms for data capture. Total revenue requirement is $29.2 million with AARR of $11.4 million.

This chapter presents a significant foundational initiative that supports emissions reduction.

RASA Staff approves adoption of Chapter 7.

CHAPTER 8. GEOGRAPHIC TRACKING (IT DIGITIZATION)

This chapter addresses geographic tracking of leaks per BP 20a and supports digital record keeping per BP 9. The records in this case are digital forms of the numerous Piping and Instrumentation Drawings of gas lines and stations, including GIS (Geographic Information System) integration and 3-D modeling of high-pressure facilities. These activities will promote better management of gas assets and better-informed response to leak events.

The chapter’s proposal is a continuation of work approved in the 2018 Compliance Plan. Total program revenue requirement is $15.8 million with AARR of $7.9 million.

RASA Staff approves adoption of Chapter 8.

CHAPTER 9 and 10.

These chapters address employee training Best Practice 13. AARR for both is $2 million.

RASA Staff approves adoption of Chapters 9 and 10.

CHAPTER 11. BLOWDOWN REDUCTION PROJECTS AT STORAGE FACILIITES

SoCalGas proposes to continue making improvements to gas storage sites to reduce vented emissions in accordance with Best Practice 23. Reductions for storage locations through 2018 are reported as 68,595 MCF from a Baseline of 112,076 MCF. SoCalGas is requesting funding for a total program revenue requirement of $32.3 million, with a large capital equipment component. The AARR is $1.3 million. Eight projects are identified in the Plan, but no emissions reduction estimate could be provided.

The projects to reduce storage emissions have been very successful to date. RASA supports continuation of these efforts.

RASA Staff approves adoption of Chapter 11.

CHAPTER 12. STATIONARY METHANE DETECTION

Best Practice 18 requires use of stationary measurement devices to continuously monitor large gas installations such as high-pressure metering and regulating stations and compressor stations. Utilities may perform pilot studies with detection equipment candidates to find the most effective solutions for their facilities. SoCalGas is proposing a second phase pilot study at approximately 10 more locations that provide a wider variety of operating conditions. No reduction estimate is yet possible. The total program revenue requirement is $10.1 million and the AARR is $640,000.

RASA Staff approves adoption of Chapter 12.

CHAPTER 13. ELECTRONIC LEAK SURVEY

Best Practice 20b, Geographic Tracking, requires leak survey data to be systematically recorded electronically by geographic location. This chapter proposes that leak surveyors will carry iPads loaded with a mobile application to use GIS-generated leak survey routes instead of paper maps. Leak survey instrumentation will be used to track leaks, and leak data will be electronically uploaded into GIS.

The total program revenue requirement is $11.7 million, and the AARR is $ 2.1 million.

RASA Staff approves adoption of Chapter 13.

CHAPTER 15. DAMAGE PREVENTION PUBLIC AWARENESS

This chapter proposes to continue development and promotion of incremental public awareness activities begun under the 2018 Plan to address Best Practices 24, 25, and 26. Studies have shown that increased awareness does reduce the number of pipeline damage events. Damaged pipelines vent gas to the atmosphere until repaired. Total program revenue requirement is $3 million with AARR of $1.5 million. No emissions reduction estimate could be determined.

Besides the GHG impact of methane emissions, excavation damage to gas pipelines is a serious safety hazard. Dig-ins can lead to combustion of gas under pressure, resulting in injuries and property damage.

RASA Staff approves adoption of Chapter 15.

CHAPTER 16. PIPE FITTING SPECIFICATIONS

Best Practice 22 requires utilities to review and revise pipe fitting specifications to ensure that pipe connections will not leak. This chapter proposes a quality control inspection process to ensure incoming threaded components meet the company specifications whose requirements can be modified as experience suggests. Total program revenue requirement is $2.4 million with AARR of $1.2 million.

RASA Staff approves adoption of Chapter 16.

CHAPTER 17. REPEAT OFFENDERS IT SYSTEM

Best Practice 26 requires a program of identifying and then communicating with excavators who repeatedly dig into gas pipelines as a result of not using the Call Before You Dig system. SoCalGas plans to complete the process of digitizing the Company Property Damage Report towards the end of 2020. Thereafter, they will transition the damage reports to mobile platforms to better perform analytics and to put in place preventative measures to mitigate damages. SoCalGas plans to develop integration between enterprise systems to transmit and store new data to be captured via new mobile forms. This system will enable the utility to analyze damage history holistically and to identify repeat offenders more readily and accurately.

Total program revenue requirement is $1.8 million; AARR is $0.86 million. No emissions reduction could be estimated.

RASA Staff approves adoption of Chapter 17.

CHAPTER 19. GAS SPECIATION (METHANE DETECTION)

Best Practice 17 requires use of enhanced methane detection devices including speciation technologies. Speciation is sometimes required to confirm the source of a methane leak. SoCalGas has already purchased the necessary equipment but needs to employ a speciation technician to continue to support use of the devices.

Total program revenue requirement is $490,000, with AARR at $245,000. No emissions reduction could be estimated for this chapter.

RASA Staff approves adoption of Chapter 19.

CHAPTER 20. PUBLIC LEAK MAPS

In accordance with Best Practice 20b, RASA in collaboration with CARB worked with utilities in 2019 to develop a model for public leak maps based on annual leak volumes by zip code. SoCalGas will implement this map at a total revenue requirement of $111,300.

RASA Staff approves adoption of Chapter 20.

CHAPTER 22. VAPOR COLLECTION SYSTEM

This chapter addresses Best Practice 23. A system to collect vented emissions from engine rod packing at the Blythe Compressor Station was funded under the 2018 Plan but construction is not completed. No new funding is requested for this activity, so no RSE was presented. This chapter estimates emissions reduction of 12,614 MCF/year, but that amount is not included in the Summary Table of emissions reductions. SoCalGas clarified with RASA Staff that they need to review actual performance before including this estimate in the reduction totals.

No additional funding is requested, so no approval is needed.

CHAPTER 25. ABOVE GROUND LEAK SURVEY – STORAGE

This chapter proposes to employ additional personnel to make repairs at gas storage sites more promptly than required by CARB regulations. For example, leaks in the largest category of 50,000 parts per million (ppm) will be repaired in less than one day, instead of the two days allowed by regulations. No reduction estimate is provided since there is no history to review. Total program revenue requirement is $3.1 million with AARR of $1.5 million.

SoCalGas will maintain records of the actual emission abatement achieved. RASA Staff expect that a cost-effectiveness review before the next Compliance Plan will indicate whether the measure should be continued.

RASA Staff approves adoption of Chapter 25.

REMAINING CHAPTERS 21-24, 26-28.

The remaining chapters do not require approval to maintain measures that are already in effect and have no funding request.

CONCLUSION

RASA Staff have reviewed all the chapters of the 2020 Compliance Plan for consistency with the 26 Best Practices, Cost Effectiveness, and qualitative safety benefits. RASA maintained its authority to approve these plans after reorganization from the Safety Enforcement Division to the Safety Policy Division.

RASA approves the SoCalGas Amended SB 1371 Natural Gas Leak Abatement Compliance Plan in full.

Appendix A: Estimated Emissions reductions to 2025

**TABLE 2. ESTIMATED EMISSIONS REDUCTION ESTIMATES to 20251**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Chapter** | **2025 Emissions Reduction, MCF** | **Avg Annual Revenue Rqt, $Million** | **% Reduction from Baseline** | **Standard Cost Effectiveness ($/MCF)** | **Net**8 **Cost Effectiveness ($/MCF)** |
| Chapter 1 - Leak Inventory Reduction | 240,769 | 23.8 | 8.685 | 78 | 56 |
| Chapter 2 - Increased Leak Survey | 133,017 | 5.0 | 4.798 | 26 | 4 |
| Chapter 3 - Blowdown Reduction Activities | 94,317 | 1.6 | 3.402 | 19 | -3 |
| Chapter 14a - Aerial Monitoring2 (Upstream) | 22,235 | 11.3 | 0.802 | 130 | 108 |
| Chapter 14b - Aerial Monitoring (Downstream) | 62,737 | see line above | 2.263 | see line above | see line above |
| Chapter 6 - Advanced Meter Analytics3 Algorithm | 37,257 | 0.3 | 1.344 | 5 | -17 |
| Chapter 5 Damage Prevention Algorithm | 7,068 | 2.2 | 0.255 | 233 | 211 |
| Chapter 28 - High Bleed Device Replacement | 1,500 | - | 0.054 | N/A4 |  |
| Chapter 18 - Meter Calibration Factor | 74 | 0.02 | 0.003 | N/A5 |  |
| Chapter 23 - Differential Pressure Testing | 5 | - | 0.000 | N/A6 |  |
| Chapter 4 - Large Leak Prioritization7 | 0 | 1.4 | 0.000 | 73 | 51 |
| **Summary** | **498,985** |  |  |  |  |
| **Percentage Reduction** | **18.00%** |  |  |  |  |

1 No additional reductions are estimated beyond 2025.

2 Cost effectiveness includes reductions from downstream facilities.

3 Downstream emissions reductions.

4 Cost Effectiveness is negative: savings are greater than costs.

5 Cost Effectiveness is negative: savings are greater than costs.

6 Cost Effectiveness is negative: savings are greater than costs.

7 Emissions reduction is only attributed for 2022, after that, will be accounted for under other measures.

8 Net Cost Effectiveness is Standard Cost Effectiveness, less Cap and Trade and Social Cost of Methane benefits.

Appendix B: Best Practices for the Natural Gas Leak Abatement Program

| No. | Best Practices | Rationale |
| --- | --- | --- |
|  | Policies and Procedures (P&P) |  |
| BP 1 | Compliance Plan  Written Compliance Plan identifying the policies, programs, procedures, instructions, documents, etc. used to comply with the Final Decision in this Proceeding (R.15-01-008). Exact wording TBD by the company and approved by the CPUC, in consultation with CARB. Compliance Plans shall be signed by company officers certifying their company’s compliance. Compliance Plans shall include copies of all policies and procedures related to their Compliance Plans. Compliance Plans shall be filed biennially (i.e. every other year) to evaluate best practices based on progress and effectiveness of Companies’ natural gas leakage abatement and minimization of methane emissions. | Each company is of a different size and has a different business model. Compliance Plans will require Companies to include those Best Practices (BPs) mandated by the Commission, noting applicable exemptions and alternatives, and any additional measures proposed by each Company to abate natural gas leakage and minimize methane emissions. However, companies must submit a Compliance Plan for approval by the CPUC, in consultation with CARB, to ensure that they are complying with the decisions of this proceeding and SB 1371. The Compliance Plan filing also incorporates many requirements for other BPs including policies and procedures, recordkeeping, training, experienced/trained personnel. In addition, other specific requirements in many leak detection, leak repair and leak prevention BPs are incorporated into the Compliance Plan filing. |
| BP 2 | Methane GHG Policy  Written company policy stating that methane is a potent Green House Gas (GHG) whose emissions to the atmosphere must be minimized. Include reference to SB 1371 and SB 1383. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of Compliance Plan filing. | Written company policies, referencing both SB 1371 (2014, Leno) and SB 1383 (2016, Lara), are needed to guide company activities and ensure effective implementation to abate natural gas leakage and minimize methane emissions. |
| BP 3 | Pressure Reduction Policy  Written company policy stating that pressure reduction to the lowest operationally feasible level in order to minimize methane emissions is required before non-emergency venting of high-pressure distribution (above 60 psig), transmission and underground storage infrastructure consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of Compliance Plan filing. | Written company policies are needed to require minimization of methane emissions from company activities (e.g. blowdowns, other operational emissions, etc.), and ensure effective implementation consistent with Operations & Maintenance (O&M) safety, system integrity and reliability requirements. |
| BP 4 | Project Scheduling Policy  Written company policy stating that any high pressure distribution (above 60 psig), transmission or underground storage infrastructure project that requires evacuating methane will build time into the project schedule to minimize methane emissions to the atmosphere consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Projected schedules of high-pressure distribution (above 60 psig), transmission or underground storage infrastructure work, requiring methane evacuation, shall also be submitted to facilitate audits, with line venting schedule updates TBD. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. | Written company policies to schedule projects for high pressure distribution, transmission or underground storage infrastructure projects to minimize methane emissions are needed to guide company activities and ensure effective implementation consistent with O&M safety, system integrity and reliability requirements. This scheduling projects BP applies to non-emergency venting of high pressure distribution (above 60 psig), transmission or underground storage infrastructure requiring methane evacuation. |
| BP 5 | Methane Evacuation Procedures  Written company procedures implementing the BPs approved for use to evacuate methane for non-emergency venting of high pressure distribution (above 60 psig), transmission or underground storage infrastructure and how to use them consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. | Written company procedures are needed to guide company activities for methane evacuation implementation and ensure effective implementation consistent with O&M safety, system integrity and reliability requirements. This methane evacuation implementation BP applies to non-emergency venting of high-pressure distribution (above 60 psig), transmission or underground storage infrastructure requiring methane evacuation. |
| BP 6 | Methane Evacuation Work Orders Policy  Written company policy that requires that for any high pressure distribution (above 60 psig), transmission or underground storage infrastructure projects requiring evacuating methane, Work Planners shall clearly delineate, in procedural documents, such as work orders used in the field, the steps required to safely and efficiently reduce the pressure in the lines, prior to lines being vented, considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. | Written company policies are needed for methane evacuation work orders to guide company activities and ensure effective implementation consistent with O&M safety, system integrity and reliability requirements. This methane evacuation work orders BP applies to non-emergency venting of high pressure distribution (above 60 psig), transmission or underground storage infrastructure requiring methane evacuation. |
| BP 7 | Bundling Work Policy  Written company policy requiring bundling of work, whenever practicable, to prevent multiple venting of the same piping consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Company policy shall define situations where work bundling is not practicable. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. | Written company policy is needed for bundling work to guide company construction and O&M activities for coordination of multiple venting of lines to minimize excess methane emissions consistent with O&M safety, system integrity and reliability requirements. This bundling work BP requires companies to define situations where work bundling is not practicable. |
| BP 8 | Company Emergency Procedures  Written company emergency procedures which describe the actions company staff will take to prevent, minimize and/or stop the uncontrolled release of methane from the gas system or storage facility consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. | Most natural gas companies have gas systems containing large volumes of methane. An uncontrolled release can negate the methane reductions of other utilities and increase GHG emissions. Written emergency company procedures are needed to guide company staff to prevent, minimize, and/or stop the uncontrolled release of methane and ensure effective implementation consistent with O&M safety, system integrity and reliability requirements. |
|  | Recordkeeping |  |
| BP 9 | Recordkeeping  Written Company Policy directing the gas business unit to maintain records of all SB 1371 Annual Emissions Inventory Report methane emissions and leaks, including the calculations, data and assumptions used to derive the volume of methane released. Records are to be maintained in accordance with G.O. 112 F and succeeding revisions, and 49 CFR 192. Currently, the record retention time in G.O. 112 F is at least 75 years for the transmission system. 49 CFR 192.1011 requires a record retention time of at least 10 years for the distribution system. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. | Accurate reporting of methane emissions and leaks, including estimation methodologies and assumptions, is critical for regulatory audits to ensure compliance. Written company policy is needed to ensure these records are maintained for all SB 1371 relevant actual measured emissions and leaks and estimated emissions and leaks including calculations, data and assumptions to derive the volume of methane released. |
|  | Training |  |
| BP 10 | Minimize Uncontrolled Natural Gas Emissions Training  Training to ensure that personnel know how to use company emergency procedures which describe the actions staff shall take to prevent, minimize and/or stop the uncontrolled release of natural gas from the gas system or storage facility. Training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company’s General Rate Case (GRC) and/or Collective Bargaining Unit (CBC) processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan. | Most natural gas companies have gas systems containing large volumes of methane. An uncontrolled release can negate the methane reductions of other utilities and increase GHG emissions. This training BP is needed to ensure personnel know how to use emergency procedures to prevent, minimize and/or stop the uncontrolled releases of methane. This training BP allows for companies to submit draft training programs along with a process to update the program once finalized to allow companies opportunities to integrate changes to their existing training and program development through their existing GRC and/or CBC processes. |
| BP 11 | Methane Emissions Minimization Policies Training  Ensure that training programs educate workers as to why it is necessary to minimize methane emissions and abate natural gas leaks. Training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company’s GRC and/or CBC processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan. | Training programs are necessary to help employees understand why it is important to abate natural gas leaks and minimize methane emissions. If they understand the reasoning behind the goals, they are more likely to comply with the company’s policies and procedures. This training BP is needed to ensure workers knows methane emissions reductions policies. This training BP allows for companies to submit draft training programs along with a process to update the program once finalized. |
| BP 12 | Knowledge Continuity Training Programs  Knowledge Continuity (Transfer) Training Programs to ensure knowledge continuity for new methane emissions reductions best practices as workers, including contractors, leave and new workers are hired. Knowledge continuity training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company’s GRC and/or CBC processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan. | New workers need to be trained in how to abate natural gas leakages and minimize methane emissions. Knowledge continuity (transfer) training programs are also needed to alleviate knowledge gaps and improve safety for new methane emissions minimization best practices. This training BP allows for companies to submit draft training programs along with a process to update the program once finalized to allow companies opportunities to integrate changes to their existing training and program development through their existing GRC and/or CBC processes. |
| BP 13 | Performance Focused Training Programs  Create and implement training programs to instruct workers, including contractors, on how to perform the BPs chosen, efficiently and safely. Training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company’s GRC and/or CBC processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan. | Training programs are necessary to instruct workers, including contractors, on how to perform BPs, efficiently and safely. This training BP is needed to ensure companies instructs workers, including contractors, on how to perform BPs, efficiently and safely. This training BP allows for companies to submit draft training programs along with a process to update the program once finalized to allow companies opportunities to integrate changes to their existing training and program development through their existing GRC and/or CBC processes. |
|  | Experienced, Trained Personnel |  |
| BP 14 | Formal Job Classifications  Create new formal job classifications for apprentices, journeyman, specialists, etc., where needed to address new methane emissions minimization and leak abatement best practices, and filed as part of the Compliance Plan filing, to be approved by the CPUC, in consultation with CARB. | According to the Unions, there is a significant need for experienced, qualified people working in the field, and also for participation in the evaluation of existing practices and development of better (best) practices. Experienced gas system workers have first-hand knowledge of how system equipment operates, what the O&M problems are and how to fix them resulting in less methane leaks. If this is accurate, then methane leaks and emissions are not entirely infrastructure issues. Experienced workers are critical to help train, improve procedures, maintain and operate equipment and to address new methane emissions reduction and leak abatement best practices. |
|  | Leak Detection |  |
| BP 15 | Gas Distribution Leak Surveys  Utilities should conduct leak surveys of the gas distribution system every 3 years, not to exceed 39 months, in areas where G.O. 112-F, or its successors, requires surveying every 5 years. In lieu of a system-wide three-year leak survey cycle, utilities may propose and justify in their Compliance Plan filings, subject to Commission approval, a risk-assessment based, more cost-effective methodology for conducting gas distribution pipeline leak surveys at a less frequent interval. However, utilities shall always meet the minimum requirements of G.O. 112-F, and its successors. | This leak detection BP recommends leak survey intervals of 3 years for all distribution pipelines formerly under the five-year leak survey requirement, unless the utility proposes and gets approved more effective leak survey cycles at a less frequent interval using a risk assessment approach. Different leak survey cycles may be appropriate for various districts or areas of a utilities’ distribution system based on risk considerations of leak history, pipe material and age, soil conditions, etc. |
| BP 16 | Special Leak Surveys  Utilities shall conduct special leak surveys, possibly at a more frequent interval than required by G.O. 112-F (or its successors) or BP 15, for specific areas of their transmission and distribution pipeline systems with known risks for natural gas leakage. Special leak surveys may focus on specific pipeline materials known to be susceptible to leaks or other known pipeline integrity risks, such as geological conditions. Special leak surveys shall be coordinated with transmission and distribution integrity management programs (TIMP/DIMP) and other utility safety programs. Utilities shall file in their Compliance Plan proposed special leak surveys for known risks and proposed methodologies for identifying additional special leak surveys based on risk assessments (including predictive and/or historical trends analysis). As surveys are conducted over time, utilities shall report as part of their Compliance Plans, details about leakage trends. Predictive analysis may be defined differently for differing companies based on company size and trends. | This leak detection BP requires utilities to conduct special leak surveys, possibly more frequently than G.O. 112-F or BP # 15, in coordination with their integrity management and other utility safety programs. Also, this BP states that the use of special leak surveys (for the purpose of SB 1371 compliance) shall be predicated on risk assessments, including predictive and historical trends analysis, if possible. This BP also allows for predictive analysis to be defined differently for differing companies based on company size and trends. |
| BP 17 | Enhanced Methane Detection  Utilities shall utilize enhanced methane detection practices (e.g. mobile methane detection and/or aerial leak detection) including gas speciation technologies. | This leak detection BP requires utilities to use enhanced methane detection practices including enhanced gas speciation technologies. This BP allows utilities to propose specific technologies that are most suitable for their gas systems and geographical areas. |
| BP 18 | Stationary Methane Detectors  Utilities shall utilize Stationary Methane Detectors for early detection of leaks. Locations include: Compressor Stations, Terminals, Gas Storage Facilities, City Gates, and Metering & Regulating (M&R) Stations (M&R above ground and pressures above 300 psig only). Methane detector technology should be capable of transferring leak data to a central database, if appropriate for location. | This leak detection BP requires utilities to utilize Stationary Methane Detectors for early detection of leaks. This BP applies to locations including compressor stations, terminals, gas storage facilities, City Gates and Metering & Regulating (M&R) Stations (M&R above ground and pressures above 300 psig only). This BP recommends that methane detector technology is capable of transferring leak data to a central database, if appropriate for location. |
| BP 19 | Above Ground Leak Surveys  Utilities shall conduct frequent leak surveys and data collection at above ground transmission and high pressure distribution (above 60 psig) facilities including Compressor Stations, Gas Storage Facilities, City Gates, and Metering & Regulating (M&R) Stations (M&R above ground and pressures above 300 psig only). At a minimum, above ground leak surveys and data collection must be conducted on an annual basis for compressor stations and gas storage facilities. | This leak detection BP requires utilities to conduct frequent leak surveys and data collection at above ground transmission and high pressure distribution (above 60 psig) facilities including Compressor Stations, Gas Storage Facilities, City Gates, and Metering & Regulating (M&R) Stations (M&R above ground and pressures above 300 psig only). This BP also requires a minimum of annual surveys to be conducted for compressor stations and gas storage facilities. |
| BP 20a | Quantification & Geographic Tracking  Utilities shall develop methodologies for improved quantification and geographic evaluation and tracking of leaks from the gas systems. Utilities shall file in their Compliance Plan how they propose to address quantification. Utilities shall work together, with CPUC and ARB staff, to come to agreement on a similar methodology to improve emissions quantification of leaks to assist demonstration of actual emissions reductions. | This leak detection BP requires utilities to develop methodologies for improved quantification of leaks. This BP also requires utilities to work together, with CPUC and ARB staff, to come to agreement on a similar methodology to improve emissions quantification of leaks to assist demonstration of actual emissions reductions. Improved quantification technologies are very much needed in the industry. Quantifying the amount of natural gas emitted from a leak is dependent on equipment sensitivities and the ability to utilize equipment successfully to measure leakage. Therefore, it is critical to improve accurate emissions inventory data as lessons learned from reviewing Annual Emissions Inventory Report data is that much of the inventory is based on estimations. |
| BP  20b | Geographic Tracking  Utilities shall develop methodologies for improved geographic tracking and evaluation of leaks from the gas systems. Utilities shall work together, with CPUC and ARB staff, to come to agreement on a similar methodology to improve geographic evaluation and tracking of leaks to assist demonstrations of actual emissions reductions. Leak detection technology should be capable of transferring leak data to a central database in order to provide data for leak maps. Geographic leak maps shall be publicly available with leaks displayed by zip code or census tract. | This BP also requires utilities to work together, with CPUC and ARB staff, to come to agreement on a similar methodology to improve geographic tracking and evaluation of leaks to assist demonstrations of actual emissions reductions. This BP also recommends that leak detector technologies are capable of transferring leak data to a central database in order to provide data for leak maps. |
|  | Leak Repairs |  |
| BP 21 | “Find It/Fix It”  Utilities shall repair leaks as soon as reasonably possible after discovery, but in no event, more than three (3) years after discovery. Utilities may make reasonable exceptions for leaks that are costly to repair relative to the estimated size of the leak. | As the only leak repair BP, this “find-it/fix-it” BP applies to all leaks. This BP requires utilities to repair all leaks within a maximum of three years of discovery, allowing for reasonable exceptions. In the short-term, utilities are also required separately to eliminate their backlog of leaks unless leak repairs are cost prohibitive. |
|  | Leak Prevention |  |
| BP 22 | Pipe Fitting Specifications  Companies shall review and revise pipe fitting specifications, as necessary, to ensure tighter tolerance/better quality pipe threads. Utilities are required to review any available data on its threaded fittings, and if necessary, propose a fitting replacement program for threaded connections with significant leaks or comprehensive procedures for leak repairs and meter set assembly installations and repairs as part of their Compliance Plans. A fitting replacement program should consider components such as pressure control fittings, service tees, and valves metrics, among other things. | This leak prevention BP addresses the very large number of threaded fittings and their known propensity to develop leaks. This BP requires companies to review and revise pipe fitting specifications and any available data on utilities’ threaded fittings, as necessary. This BP requires utilities to review their own pipe fittings specifications along with available data and if necessary, propose a fitting replacement program as part of their Compliance Plan. For example, Aeronautical National Pipe Taper (ANPT) threads (ANSI SAE AS71051) may be less leak-prone than National Pipe Taper (NPT) pipe threads (ANSI/ASME B1.20.1) since the former has 2 threads and the latter has 3 threads. However, other types of threads or connections may prove better. |
| BP 23 | Minimize Emissions from Operations, Maintenance and Other Activities  Utilities shall minimize emissions from operations, maintenance and other activities, such as new construction or replacement, in the gas distribution and transmission systems and storage facilities. Utilities shall replace high-bleed pneumatic devices with technology that does not vent gas (i.e. no-bleed) or vents significantly less natural gas (i.e. low-bleed) devices. Utilities shall also reduce emissions from blowdowns, as much as operationally feasible. | Most natural gas companies have gas systems containing large volumes of methane. Large amounts of fugitive and vented emissions from operations, maintenance and other activities, along with unforeseen catastrophic releases, can negate the methane reductions by other measures and significantly increase GHG emissions. This leak prevention BP focuses on minimizing fugitive and vented methane emissions including those from catastrophic releases, high-bleed pneumatics and blowdowns. This BP requires replacement of high-bleed pneumatic devices and also requires reduction of blowdown emissions, as much as operationally feasible. |
| BP 24 | Dig-Ins / Public Education Program  Dig-Ins – Expand existing public education program to alert the public and third-party excavation contractors to the Call Before You Dig – 811 program. In addition, utilities must provide procedures for excavation contractors to follow when excavating to prevent damaging or rupturing a gas line. | Dig-Ins are a major cause of gas line ruptures. The utilities are already required to implement Dig-In public awareness programs. This leak prevention BP requires utilities to expand their existing public education programs and to provide procedures for excavation contractors to follow when excavating. |
| BP 25 | Dig-Ins / Company Standby Monitors  Dig-Ins – Utilities must provide company monitors to witness all excavations near gas transmission lines to ensure that contractors are following utility procedures to properly excavate and backfill around transmission lines. | Dig-Ins are a major cause of gas line ruptures. This leak prevention BP is necessary to ensure contractors follow utility excavation and backfill procedures around transmission lines in order to try to prevent damage to a transmission line. (It is possible to nick or damage a transmission line which can be a root cause for a rupture years later.) |
| BP 26 | Dig-Ins / Repeat Offenders  Utilities shall document procedures to address Repeat Offenders such as providing post-damage safe excavation training and on-site spot visits. Utilities shall keep track and report multiple incidents, within a 5-year period, of dig-ins from the same party in their Annual Emissions Inventory Reports. These incidents and leaks shall be recorded as required in the recordkeeping best practice. In addition, the utility should report egregious offenders to appropriate enforcement agencies including the California Contractor’s State License Board. The Board has the authority to investigate and punish dishonest or negligent contractors. Punishment can include suspension of their contractor’s license. | This leak prevention BP requires utilities to document procedures to address Repeat Offenders and to track and report multiple incidents in their Annual Emissions Inventory Reports. This BP recommends utilities report egregious offenders to appropriate enforcement agencies. This BP requires these incidents and leaks to be recorded under the Recordkeeping BP. |

1. D. 19-08-020 at 56. [↑](#footnote-ref-1)
2. AL 5603-G-C, at 3. [↑](#footnote-ref-2)
3. Ibid, p. 7 and Attachment A. [↑](#footnote-ref-3)
4. D. 19-08-020 at 19. [↑](#footnote-ref-4)
5. 1 MCF=1,000 cubic feet. 1 MCF is equal to 1.037 million British thermal units (MMBtu). In 2019, natural gas spot prices at Henry Hub, the pricing point for natural gas futures on the New York Mercantile Exchange, averaged $2.57 per MMBtu or $2.67 per MCF. [↑](#footnote-ref-5)
6. D.19-08-020 at 36. [↑](#footnote-ref-6)
7. Ibid. [↑](#footnote-ref-7)
8. Ibid, at 39. [↑](#footnote-ref-8)
9. The total forecasted revenue requirement is $285 million. [↑](#footnote-ref-9)
10. Current methods largely rely on emissions estimation using population-based Emission Factors for gas devices such as Meter-Set Assemblies and Metering & Regulating Stations. This method cannot account for changes in actual emission volumes. See D.19.08-020, at 50. [↑](#footnote-ref-10)
11. Approval authority confirmed in D.19.08-020 at 19 [↑](#footnote-ref-11)
12. Leno, chapter 525 statutes of 2014 [↑](#footnote-ref-12)
13. [D.19.08-020](https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M311/K449/311449621.PDF), at p. 19. [↑](#footnote-ref-13)
14. D. 19-08-020 at 36 [↑](#footnote-ref-14)
15. [D.15-01-008](https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M144/K952/144952657.PDF), Ordering Paragraph 3, p. 82. [↑](#footnote-ref-15)
16. D. 19-08-020 at Page 16. [↑](#footnote-ref-16)
17. 19.08-020 at page 16. [↑](#footnote-ref-17)