



December 12, 2025

Advice 5149-G

(Pacific Gas and Electric Company ID U 39-G)

Advice 6569-G

(Southern California Gas Company ID U 904-G)

Advice 3481-G

(San Diego Gas and Electric Company ID U 902-G)

Advice 1358-G

(Southwest Gas Corporation ID U 905-G)

Public Utilities Commission of the State of California

Subject: Joint Advice Letter Documenting 2025 Research on Mercury Impacts of Pacific Gas and Electric Company, Southern California Gas Company, San Diego Gas & Electric Company, and Southwest Gas Corporation

Purpose

Pacific Gas and Electric Company (PG&E), Southern California Gas Company (SoCalGas), San Diego Gas & Electric Company (SDG&E), and Southwest Gas Corporation (Southwest Gas) (collectively, the Joint Utilities), hereby submit this Joint Advice Letter in compliance with direction provided by the Executive Director of the California Public Utilities Commission (CPUC or Commission) in a Letter Granting the Joint Utilities time to comply with Commission Decision (D.) 20-12-031 to update the mercury constituent of concern Lower and Upper Action Limits (UAL/LAL) by January 1, 2022.

Background

Ordering Paragraph (OP) 11 of D.20-12-031 states that the Joint Utilities shall provide UAL/LAL specifications in a joint filing to be submitted to the Commission no later than April 1, 2021 for biologicals and January 1, 2022 for ammonia, mercury, and siloxanes. UAL/LAL of hydrogen will be established pursuant to Phase 4 of Rulemaking (R.) 13-02-008.

On December 21, 2021, pursuant to Rule 16.6 of the Commission's Rules of Practice and Procedure, the Joint Utilities filed a letter of extension to comply with OP 11 of D.20-12-031. Specifically, the Joint Utilities requested this extension of time to update the mercury

constituent of concern UAL/LAL until adequate research and/or operation data is available to support such limits.

On December 30, 2021, the Joint Utilities submitted their individual Advice Letters with rule modifications per OP 11 of D.20-12-031. The Advice Letters provided UAL/LAL specifications for ammonia and siloxanes but did not provide specifications for mercury due to inadequate available research. Instead, the Joint Utilities proposed to continue to monitor available literature and gather operational data to support a recommendation in the future.

On January 13, 2022, Executive Director Rachel Peterson granted the Joint Utilities' request to maintain the existing Trigger Level for mercury of 0.08 mg/m³ while continuing to monitor available literature and gather operational data to support a recommendation to update the UAL/LAL specifications for mercury once sufficient information is available. The letter also ordered that until such time as sufficient information is available to update the UAL/LAL specifications for mercury, the Joint Utilities shall submit a Tier 1 Advice Letter on or before December 31 of each calendar year documenting research on mercury impacts on pipeline integrity. For calendar year 2021, the Advice Letter may be submitted on or before January 31, 2022.

The Joint Utilities described the latest research for calendar year 2022 and 2023 in their respective Advice Letters submitted on December 29, 2022¹, December 29, 2023² and 2024.³ Pursuant to Executive Director Rachel Peterson's order, the Joint Utilities have included a description of their research as part of this Advice Letter.

Industry research continues to be largely limited to the impact of mercury on infrastructure used for cryogenic operations, where liquefied natural gas equipment shows corrosion, such as brazed aluminum heat exchangers, and as a result a cryogenic limit for mercury was established at 10 ng/m³ (or 0.00001 mg/m³ for reference). It is important to note that cryogenic operations are not applicable to the Joint Utilities' service territories in California. Additionally, it is common practice by cryogenic operators to use mercury guard beds to protect equipment integrity from the risks that mercury poses.

The focus of the Joint Utilities is on the effects of mercury on the natural gas pipeline infrastructure and end-user equipment, rather than cryogenic operations. The following is a summary of the continuous efforts by the Joint Utilities to gain sufficient information to establish UAL/LAL specifications for mercury:

¹ SoCalGas Advice 6073-G, SDG&E Advice 3148-G, PG&E Advice 4694-G, and Southwest Gas Advice 1245-G.

² SoCalGas Advice 6238-G, SDG&E Advice 3265-G, PG&E Advice 4848-G, and Southwest Gas Advice 1282-G

³ SoCalGas Advice 6415-G, SDG&E Advice 3379-G, PG&E Advice 5016-G, and Southwest Gas Advice 1318-G

SoCalGas and SDG&E have interconnected numerous renewable natural gas (RNG) projects and reported operational data, as required, from a diverse mix of RNG supplies including dairy, wastewater, and other organic sources. Gas quality in these projects has not shown mercury at a concentration exceeding the current trigger level. Southwest Gas has interconnected with a wastewater RNG supplier that has not shown mercury at a concentration exceeding the current trigger level. These results suggest that mercury concentration at a level that would present any integrity concern is not a likely occurrence for these RNG sources. In 2025, there were no mercury exceedances of the current trigger level. Landfill RNG projects, a potential source of mercury, are not currently interconnected nor in the planning stages with Southwest Gas' systems. SoCalGas interconnected and began receiving RNG from its first Landfill RNG project in October 2025. The interconnector's pre-injection testing and the 24-hour start up testing results showed that mercury was not detected in the gas at that time.

Since 2022, PG&E has interconnected three RNG projects and reported operational data as required for dairy interconnect facilities. In 2024, PG&E interconnected three additional RNG projects— dairy (1), landfill (1) and food waste (1). As of this advice filing, PG&E has a total of seven (7) RNG facilities interconnected to its gas system and where operational data has been collected.

Test results from the pre-injection tests performed by the project developers and ongoing periodic testing performed by PG&E have shown undetected/below trigger levels for Mercury at PG&E 's RNG interconnect facilities.

SoCalGas specified the use of corrosion coupons from various materials used in SoCalGas pipeline and operations. These coupons will be strategically installed at several RNG sites. The purpose is to monitor the impact of different trace amounts of mercury on these materials, if detected, in the gas stream. In 2024, there were still no mercury exceedances.

SoCalGas and Southwest Gas initiated a Gas Technology Institute (GTI) Energy OTD (7.23.k) project for Mercury Action Limits for RNG Specifications. The Phase 1 objective was to develop a test plan for lab testing at Southwest Research Institute (SwRI) leveraging the literature review on the impact of trace amounts of mercury in a gas stream on common construction materials, as well as impacts on similar equipment found in a natural gas distribution network and end use equipment. The Phase 2 objective is to conduct laboratory testing that could inform the selection of appropriate mercury trigger and action levels for natural gas distribution systems. The Phase 1 study began in the first quarter of 2023. An update of the literature review was performed to identify any new research completed in the area. The literature study review concluded that while there is plenty of literature focusing on mercury corrosion of materials, very few are directly applicable for mercury corrosion in the natural gas network. The literature review was a useful resource for test plan development. The test setup was designed to complete tests on a variety of representative materials and equipment from the natural gas distribution network over a wide range of relevant mercury concentrations. The test plan for Phase 2

was proposed in the fourth quarter of 2023, and the project kicked off in early 2024. PG&E provided input to the development of the test plan and joined as a funder of the project with Phase 2. In 2024, the test system was constructed and commissioned using 100% natural gas. Final pre-test performance checks on the hardware were completed with mercury testing scheduled to begin in the first quarter of 2025.

In calendar year 2024, the Joint Utilities continued to seek developments in research on mercury impacts on pipeline integrity for calendar year and focused on the test setup for the Phase 2 research project through GTI Energy to support a UAL/LAL recommendation. The Joint Utilities will continue to monitor available literature and gather operational data for the purpose of gaining sufficient information to update the UAL/LAL specifications for mercury.

Herein, the Joint Utilities describe their latest research on mercury impacts on pipeline integrity for calendar year 2025.

2025 Status Update Regarding Research of Mercury Impacts on Pipeline Integrity

As described above, the objective of this research effort, which initiated in 2024, is to execute the test plan developed in Phase 1 by Southwest Research Institute (SwRI) for experimental determination of the impact from vapor phase mercury on components and materials found in end use and pipeline distribution equipment.

From January 16, 2025 through May 2, 2025, the Phase 2 project team conducted “Test Run 1”, using gas streams with two mercury concentrations ($80 \mu\text{g}/\text{m}^3$ and $800 \mu\text{g}/\text{m}^3$), for a total of 102 days of exposure. Based on preliminary results and discussion with the project team, “Test Run 2” was configured with a baseline gas stream (no mercury) and $800 \mu\text{g}/\text{m}^3$ mercury. This second test commenced on August 8, 2025 and is expected to conclude in mid-December 2025. Currently, comprehensive analysis is underway of test articles removed after “Test Run 1” and includes a review of weight, hardness, photographs, examination of selected material samples using Scanning Electron Microscopy with Energy Dispersive Spectroscopy (SEM/EDS), functional checks, and post-experimental examination of mercury wetted parts.

A comprehensive analysis of the results will follow upon completion of “Test Run 2.” This research effort is expected to be completed in the first quarter of 2026 with an initial draft report due March 31, 2026 and a final report expected April 30, 2026. See Attachment A for the current project status.

The Joint Utilities will review the results of the research effort and determine if data can be used to inform the selection of appropriate mercury trigger and action levels for natural gas distribution systems.

Protests

Anyone may protest this Advice Letter to the Commission. The protest must state the grounds upon which it is based, including such items as financial and service impact, and should be submitted expeditiously. The protest must be submitted electronically and must be received within 21 days⁴ after the date of this Advice Letter, which is January 2, 2026. Protests should be submitted to the attention of the Energy Division Tariff Unit at:

E-mail: EDTariffUnit@cpuc.ca.gov

In addition, protests and all other correspondence regarding this Advice Letter should also be sent electronically to the attention of:

For PG&E: Attn: Sidney Bob Dietz II Director, Regulatory Relations
c/o Megan Lawson
E-mail: PGETariffs@pge.com

For SoCalGas: Attn: Veronica Arroyo
Regulatory Tariff Manager
E-mail: VGarcia2@socalgas.com
E-mail: Tariffs@socalgas.com

For SDG&E: Attn: Greg Anderson
Regulatory Tariff Manager
E-mail: GAnderson@sdge.com
E-mail: SDGETariffs@sdge.com

For SWG: Attn: Laurie Brown
Regulatory Manager/California
E-mail: Laurie.Brown@swgas.com
E-mail: regserve@swgas.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name and e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

⁴ The 20-day protest period concludes on a holiday; therefore, PG&E is moving this date to the following business day.

Effective Date

Pursuant to General Order (GO) 96-B, Rule 5.1, (and OP 11 of D.20-12-031), this advice letter is submitted with a Tier 1 designation. The Joint Utilities requests that this Tier 1 advice submittal become effective upon date of submittal, which is December 12, 2025.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically to parties shown on the attached list and the parties on the service list for R.13-02-008. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter submittals can also be accessed electronically at: <http://www.pge.com/tariffs/>.

/S/

Sidney Bob Dietz II
Director, Regulatory Relations
CPUC Communications

Attachment

cc: R.13-02-008 Service List



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Pacific Gas and Electric Company (ID U39 G)

Utility type:

☐ ELC ☒ GAS ☐ WATER
☐ PLC ☐ HEAT

Contact Person: Kimberly Loo

Phone #: (279)789-6209

E-mail: PGETariffs@pge.com

E-mail Disposition Notice to: Kimberly.Loo@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 5149-G, et al.

Tier Designation: 1

Subject of AL: Joint Advice Letter Documenting 2025 Research on Mercury Impacts of Pacific Gas and Electric Company, Southern California Gas Company, San Diego Gas & Electric Company, and Southwest Gas Corporation

Keywords (choose from CPUC listing): Compliance

AL Type: ☐ Monthly ☐ Quarterly ☐ Annual ☒ One-Time ☐ Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: D.20-12-031

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? ☐ Yes ☒ No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? ☐ Yes ☒ No

Requested effective date: 12/12/25

No. of tariff sheets: N/A

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected:

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: N/A

¹Discuss in AL if more space is needed.

Protests and correspondence regarding this AL are to be sent via email and are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

California Public Utilities Commission
Energy Division Tariff Unit Email:
EDTariffUnit@cpuc.ca.gov

Contact Name: Sidnev Bob Dietz II. c/o Megan Lawson
Title: Director, Regulatory Relations
Utility/Entity Name: Pacific Gas and Electric Company

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email: PGETariffs@pge.com

Contact Name:
Title:
Utility/Entity Name:

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

CPUC
Energy Division Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102

Clear Form

Attachment A

November 21, 2025

Project Status Update for Operations Technology Development (OTD) Project 7.23.k.2 (Mercury Action Limits for RNG Specifications Phase 2)

Objective

The objective of this project is to execute the test plan developed in Phase 1 by Southwest Research Institute (SwRI) for experimental determination of the impact from vapor phase mercury on components and materials found in end use and pipeline distribution equipment. This data can be used to inform the selection of appropriate mercury trigger and action levels for natural gas distribution systems.

Project Timeline

- The project kickoff call was held with SwRI and the project sponsors on 04/24/2024 after negotiation of the subcontract. There was a 4 month delay while the subcontract was being negotiated.
- Mercury test equipment was ordered 05/13/2024 and delivered 10/25/2024 (delay of 2 months).
- While waiting for equipment delivery the test area and testing chambers were constructed, piping installed, test articles selected and prepared, and safety equipment installed. After delivery, installation, training, and commissioning of the equipment commenced.
- Test Run 1 utilizing two gas streams containing 80 $\mu\text{g}/\text{m}^3$ and 800 $\mu\text{g}/\text{m}^3$ of mercury initiated on 01/16/2025 and completed on 05/02/2025 with 102 days of exposure.
- Preliminary testing was performed to provide input to determine the next exposure concentrations. After discussions with the technical team and sponsors, it was decided to use a baseline gas stream of no mercury and to continue with the 800 $\mu\text{g}/\text{m}^3$ of mercury. Additional test articles were added to the high mercury concentration chamber. The necessary revisions to the test setup were made.
- Test Run 2 utilizing two gas streams containing no mercury and 800 $\mu\text{g}/\text{m}^3$ of mercury initiated on 08/08/2025.

Current Status

- Test Run 2 is ongoing and is expected to end in mid-December.
- Comprehensive testing is underway of test articles removed after Test Run 1.
 - Mass, Hardness, and Photographs plus
 - Scanning Electron Microscopic with Energy Dispersive Spectroscopy (SEM/EDS) examination of selected material samples
 - Functional checks and post-experimental examination of mercury wetted parts.
- Test articles from Test Run 2 will be examined once Test Run 2 is complete.
- A no cost time extension was requested once Test Run 2 began and the schedule became clearer.
- Final draft report is expected to be submitted 03/31/2026.
- Final report is expected to be submitted 04/30/2026.

Sincerely,



Karen Crippen, Director, Analytical Services
847-768-0604, kcrippen@gti.energy

**PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV**

AT&T	Ellison Schneider & Harris LLP	Pacific Gas and Electric Company
Albion Power Company		Peninsula Clean Energy
Alta Power Group, LLC	Electrical Power Systems, Inc. Fresno	Pioneer Community Energy
Anderson & Poole	Engie North America	Public Advocates Office
BART	Engineers and Scientists of California	Redwood Coast Energy Authority
Ava Community Energy		Regulatory & Cogeneration Service, Inc.
BART		Resource Innovations
Buchalter	GenOn Energy, Inc.	Rockpoint Gas Storage
Barkovich & Yap, Inc.	Green Power Institute	
Biering & Brown LLP		
Braun Blaising Smith Wynne, P.C.	Hanna & Morton LLP	San Diego Gas & Electric Company
		San Jose Clean Energy
		SPURR
California Community Choice Association	ICF consulting	
California Cotton Ginners & Growers Association	iCommLaw	Sempra Utilities
California Energy Commission	International Power Technology	Sierra Telephone Company, Inc.
California Hub for Energy Efficiency	Intertie	Southern California Edison Company
California Alternative Energy and Advanced Transportation Financing Authority	Intestate Gas Services, Inc.	Southern California Gas Company
California Public Utilities Commission		Spark Energy
Calpine	Kaplan Kirsch LLP	Sun Light & Power
Cameron-Daniel, P.C.	Kelly Group	Sunshine Design
Casner, Steve	Ken Bohn Consulting	Stoel Rives LLP
Center for Biological Diversity	Keyes & Fox LLP	
Chevron Pipeline and Power	Leviton Manufacturing Co., Inc.	Tecogen, Inc.
	Los Angeles County Integrated	TerraVerde Renewable Partners
		Tiger Natural Gas, Inc.
Clean Power Research	Waste Management Task Force	
Coast Economic Consulting		
Commercial Energy	MRW & Associates	Utility Cost Management
Crossborder Energy	Manatt Phelps Phillips	
Crown Road Energy, LLC	Marin Energy Authority	Water and Energy Consulting
	McClintock IP	
	McKenzie & Associates	
Davis Wright Tremaine LLP	Modesto Irrigation District	
Day Carter Murphy	NLine Energy Inc.	Yep Energy
Dept of General Services	NOSSAMAN LLP	
Douglass & Liddell	NRG Energy Inc.	
Downey Brand LLP		
	OnGrid Solar	