



Annual Report Number 5
Work of the Aliso Canyon Well and Storage
Operations Safety Committee
July 2023 – June 2024

Report Date: August 31, 2024

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Overview

SoCalGas (Defendant) and the State Attorney General, City Attorney for the City of Los Angeles, County Counsel for the County of Los Angeles, and the County of Los Angeles (collectively referred to as Government Plaintiffs) entered a Consent Decree to resolve claims raised by the Government Plaintiffs associated with the natural gas leak that occurred at the Aliso Canyon natural gas storage Facility (Facility) in October 2015. The terms and conditions of the Consent Decree required SoCalGas to, among other things, form an internal safety committee, and select and retain a third-party subsurface gas storage industry expert (Safety Ombudsman) who shall act as a safety advocate for the Facility. A copy of the Consent Decree may be accessed via this link: [Click Here](#)

Section 4.2 of the Consent Decree outlines the requirements for SoCalGas to establish a Well and Storage Operations Safety Committee (WSOC). The duties of the WSOC include but are not limited to the following:

- Meet quarterly to review safety issues at the Facility.
- Review operational safety issues and promote safe operations at the Facility consistent with applicable laws, rules, regulations, and orders.
- Review Facility-related information, materials, or work product to assess safety at the Facility.
- Make recommendations to SoCalGas for repairs, improvements, policies, and/or upgrades to the Facility or infrastructure therein.
- Facilitate the role of, and work in cooperation with, the Safety Ombudsman.
- In coordination with the Safety Ombudsman, conduct periodic safety audits or safety-related Strengths, Weaknesses, Opportunities, Threats (“SWOT”) analyses of the Facility.
- Review California Public Utilities Commission (CPUC) and California Department of Conservation Geologic Energy Management Division (CalGEM) audit reports of the Facility.

Section 4.3 of the Consent Decree outlines the requirements for SoCalGas to select and retain a Safety Ombudsman and the duties associated with that role. The duties of the Safety Ombudsman include the following:

- Participate in all Well and Storage Operations Safety Committee (WSOC) meetings.
- Have access to all non-privileged materials, information, records, and work product in SoCalGas’ possession, custody, and control necessary to accomplish the tasks required of the Safety Ombudsman.
- Review CPUC and CalGEM audit reports of the Facility.
- Review and evaluate all incidents reported to the public and State and local agencies pursuant to Section 4.1 of the Consent Decree.
- Review and advise on the WSOC’s efforts, findings, and recommendations for improvements.
- Serve as a non-exclusive repository for safety-related concerns reported by the public with respect to the Facility.
- Serve as a point of contact to receive safety complaints or concerns relating to the Facility from anyone who wishes to remain anonymous and provide any anonymous reports of safety concerns to SoCalGas.

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- Maintain the privacy of the person or member of the public confidentially making safety complaints or concerns relating to the Facility.
- Generate annual reports (Annual Reports) that detail the following:
 - The work of the Safety Ombudsman.
 - The work of the WSOC.
 - Recommendations, if any, for improvements related to safety and prevention of leaks at the Facility.
- Provide the Annual Reports to the Attorney General, the City Attorney, County Counsel, the CPUC and CalGEM. The Annual Reports shall also be made public via the Aliso Canyon Website and the local community shall be provided with an opportunity to comment on the Annual Reports. The Safety Ombudsman shall schedule at least one public meeting each year to explain and respond to questions regarding the Annual Reports.

This report has been prepared in accordance with the requirements outlined in Section 4.3, (b), (ix), (2) of the Consent Decree, and summarizes the work of the WSOC during the period of July 2023 – June 2024. It is the fifth such annual report.



I. Well and Storage Operations Safety Committee (WSOC) Charter and WSOC Meetings

WSOC Charter

SoCalGas established a Well and Storage Operations Safety Committee (WSOC) to review safety issues at the Facility. The committee purview includes but is not limited to safety issues related to well integrity and maintenance and prevention of unintended leaks; it excludes issues related to occupational health and safety as those are administered by a separate department.

The SoCalGas Aliso Canyon Well and Storage Operations Safety Committee Charter provides a complete summary of the WSOC's function and defines roles, responsibilities, and governance of the WSOC. A copy of the Charter may be accessed via this link: [Click Here](#)

The following is a paraphrased description of the WSOC membership and duties as detailed in the WSOC Charter.

The WSOC is comprised of nine (9) members, including a committee Chair, Vice Chair, and Secretary. There are five (5) voting members and four (4) non-voting members. The five (5) voting members include one (1) SoCalGas Director of Storage, two (2) SoCalGas Managers of Storage, and two (2) SoCalGas Storage Supervisors. The non-voting members of the WSOC include subject matter experts with relevant storage technical expertise.

The role of the WSOC is to review and provide recommendations regarding safety issues at the Facility to SoCalGas and coordinate with the Safety Ombudsman. WSOC duties include:

1. Review operational safety issues and promote safe operations consistent with applicable laws, rules, regulations, and orders;
2. Review Facility-related information, materials, or work product to assess safety at the Facility;
3. Make recommendations to SoCalGas for repairs, improvements, policies, and/or upgrades to the Facility and its infrastructure;
4. Facilitate the role of, and work in cooperation with, the Safety Ombudsman;
5. In coordination with the Safety Ombudsman, conduct periodic safety audits or safety-related Strengths, Weaknesses, Opportunities, Threats (SWOT) analyses of the Facility; and
6. Review California Public Utilities Commission (CPUC) and California Geologic Energy Management Division (CalGEM) audit reports of the Facility.

The Chair, Vice Chair, and Secretary of the Committee are nominated by the Senior Vice President and/or the Vice President of Storage and confirmed by the WSOC. Those three (3) positions are elected to two (2)-year terms, although individuals may serve more than one (1) term. Remaining members of the Committee are selected by the Senior Vice President and/or the Vice President of Storage; members are appointed biennially or as necessary to fill vacancies. The Chair manages WSOC meetings and must be a voting member of the committee. The Vice Chair performs the duties of the Chair in the Chair's absence. The Vice Chair may be a non-voting member; however, they will have voting rights when performing the duties of the Chair. The Secretary may be a non-voting member and prepares the minutes of the WSOC meetings.

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The WSOC normally meets quarterly but may meet more frequently if it deems there is a need to do so. A majority of WSOC voting members is required, either in person or telephonically, to convene a meeting. Recommendations for formal action require a majority vote of the voting membership. The Safety Ombudsman is required to participate in all WSOC meetings, either in person or telephonically. Legal counsel is required to attend all WSOC meetings.

Quarterly WSOC Meetings

Four (4) WSOC meetings were held during the July 2023 – June 2024 period, as noted below:

- September 22, 2023 (virtual);
- December 14, 2023 (in person);
- March 19, 2024 (virtual); and
- June 7, 2024 (in person).

The Safety Ombudsman participated in all meetings, including in person at the December and June meetings. The quarterly meeting agenda includes:

1. Review and approval of the prior meeting minutes;
2. Update from the Safety Ombudsman concerning public inquiries and other relevant topics;
3. Update from WSOC members concerning safety-related matters associated with the Aliso Canyon Facility;
4. CalGEM audit status; and
5. Joint discussion of other relevant matters related to the Aliso Canyon Facility.

The meetings provide a forum for discussions between the WSOC members and the Safety Ombudsman on safety-related matters at the Facility. Topics vary from meeting to meeting depending upon current issues, maintenance and construction work activity at the Facility, and safety concerns. Members of the WSOC provide updates of construction and/or maintenance work at the Facility with the emphasis on safety, the status of ongoing discussions with CalGEM staff concerning SoCalGas' Risk Management Plan for the Facility, and the status of periodic audits of the Facility by CPUC and CalGEM staff. The WSOC meetings provide an opportunity for the Safety Ombudsman to probe any safety concerns, establish a dialog directly with the appropriate subject matter experts, and give feedback to the WSOC concerning committee work or other safety-related initiatives at the Facility.

During the period of July 2023 – June 2024, discussion topics included but were not limited to:

- Presentation and discussion of a general safety theme at the start of each meeting, including incidents from the natural gas pipeline and gas storage industry.
- The development of additional, and enhancement of existing, Gas Standards relevant to the safety of underground natural gas storage facilities.
- Status of Data Requests from the Safety Ombudsman and subsequent SoCalGas responses.
- Preparation of the Safety Ombudsman Annual Reports and public interactions, including any concerns, issues, or complaints submitted to the Safety Ombudsman by members of the public.



- Recommendations of the WSOC and/or the Safety Ombudsman and the status of SoCalGas plans in response to the recommendations.
- Audits performed by the WSOC examining adherence to SoCalGas' Gas Standards, and reviews and updates of SIMP (Storage Integrity Management Program) standards.
- Status of the CalGEM/PHMSA audits through the July 2023 – June 2024 period.
- Status of the Aliso Canyon Risk Management Plan (RMP), well integrity assessments, and individual well reassessment period adjustments granted by CalGEM.
- Discussion of well and reservoir risk assessment for the Aliso Canyon gas storage facilities.

Individual links to the minutes of the WSOC meetings are included immediately below. Names of individuals have been redacted from the meeting minutes.

- September 2023 meeting minutes link: [Click Here](#)
- December 2023 meeting minutes link: [Click Here](#)
- March 2024 meeting minutes link: [Click Here](#)
- June 2024 meeting minutes link: [Click Here](#)

In alignment with the WSOC Charter, no change in membership occurred for the 2023 – 2024 period.

II. Review of Operational Safety Issues and Information, Materials, or Work Product to Assess Facility Safety

Each WSOC quarterly meeting agenda includes a review of current operational activities, with specific routine areas discussed during the July 2023 – June 2024 period as follows:

- Well integrity assessment updates;
- Risk Management Plan submittal update;
- Audits of operational discipline to procedures; and
- Well work in progress and planned.

Details concerning these discussions may be found by accessing the link to the minutes of each meeting at the bottom of [Section I](#) of this report, immediately above.

Public Meeting

At the December 2023 WSOC meeting, the Safety Ombudsman reported on the annual public meeting, which was held virtually the evening of October 11, 2023. The meeting lasted 1.5 hours, including a question-answer period following the Safety Ombudsman's summary presentation covering the three annual reports. One meeting attendee provided significant input to the Safety Ombudsman concerning the seismic-event fault displacement threat and the application of subsurface safety valves or other forms of mitigation to limit the flow of fluids from a well should a severe event occur that causes a breach of the tubing-casing-cement. The Ombudsman had additional discussion with the commentor after the public meeting.

Following the public meeting, the Safety Ombudsman formed data requests responsive to the public input, and continued work on the issues with and through the WSOC.

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The data requests are summarized below, but Annual Report Number 5 – Work of the Safety Ombudsman, describes the data requests and responses and provides a link to the public meeting materials: [Click Here](#)

Data Requests

The WSOC participated in material submissions in response to the Safety Ombudsman's data requests on his own behalf, and on behalf of and related to public inquiries. The Safety Ombudsman made data requests #19, #19A, #20, and #21 during the July 2023 – June 2024 period.

Data Requests #19 and #19A

The Ombudsman delivered Data Request #19 on November 20, 2023. SoCalGas responded on March 1, 2024.

DR#19 included six (6) questions relating to SoCal's experience with subsurface safety valve designs, operation, maintenance, and testing practices, reliability of subsurface safety valve function, efforts to increase reliability, SoCal's current application of subsurface safety valves, and SoCal's position on use of subsurface safety valves to mitigate risk.

SoCal's responses were sufficient and detailed to allow the Ombudsman to independently estimate past reliability of deep-set and shallow-set safety valves, which is presented in Annual Report Number 5 – Work of the Ombudsman (link provided above).

The Ombudsman developed and delivered Data Request #19A to SoCalGas on March 14, 2024, asking five (5) questions seeking more information on deep-set subsurface safety valve designs and shallow-set subsurface safety valve designs historically used in Aliso Canyon gas storage wells.

SoCalGas provided responses to DR#19A on August 12, 2024, providing the Ombudsman with additional detail regarding assessment of wells for application of subsurface safety valves and understanding of reliability issues of past subsurface safety valve systems employed by SoCalGas in the Aliso Canyon Facility. The Ombudsman's summary of the information obtained from DR#19A responses is presented in Annual Report Number 5 – Work of the Ombudsman (link provided above).

Data Request #20

Data Request #20, submitted to SoCalGas on November 21, 2023, delivered five (5) questions regarding geohazard risk assessments for Aliso Canyon gas storage wells, focused on landslide threats and fault displacement threats. The Ombudsman asked SoCal to identify how susceptibility of wells to landslide and fault displacement threats changed after the reworking of wells to add new inner casing strings and/or tubing strings. The Ombudsman asked how SoCal is characterizing risk related to landslide and fault displacement threats and how the company was applying other research related to gas storage risk in its own risk assessments for Aliso Canyon gas storage wells.

SoCalGas provided responses on May 22, 2024. SoCal's responses were adequate to answer the immediate questions but the Ombudsman used the June 7, 2024 WSOC meeting to discuss several potential follow-up questions. Subsequent to the June 2024 WSOC meeting, SoCal provided the Ombudsman with confidential site-specific risk assessment information for its Aliso Canyon wells. Annual Report Number 5 – Work of the Safety Ombudsman (link provided above) describes the SoCalGas progress and results in general terms. The meeting following the June 2024 WSOC meeting was sufficient to provide the Ombudsman with additional detail and negated the need for a follow-up data request.

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However, as a result of the Ombudsman’s review and analysis of SoCalGas responses to Data Requests 19 and 20 and the additional risk assessment discussions, the Ombudsman identified recommendations as described in Annual Report Number 5 – Recommendations for Improvements Related to Safety and Leak Prevention (link provided in [Section III](#) of this report below).

Data Request #21

The Ombudsman requested an up-to-date copy of the Management of Change procedure, which SoCalGas identified as Data Request #21 and provided on March 1, 2024. The request related to the planning of a SWOT (Strengths-Weaknesses-Opportunities-Threats) exercise the WSOC was preparing to do pursuant to its Consent Decree duties.

Well Integrity Risk Reduction and Risk Assessment

Each WSOC meeting includes review and discussion of the well work and well integrity assessments completed or in progress.

At the Aliso Canyon facility, wells have been plugged in accordance with CalGEM and PHMSA rules, essentially filling all voids with cement, and reducing the well count to sixty (60) injection/withdrawal (I/W) wells by plugging fifty-four (54) wells since late 2016. As of June 2024, forty-three (43) out of sixty (60) I/W wells have had complete new inner casing strings installed since 2016.

All wells have had 2nd-round assessments, which includes casing inspection logs; forty (40) wells have had 3rd-round reassessments and five (5) wells have had 4th-round reassessments.

In calendar year 2023, well integrity reassessments were completed on fifteen (15) wells; two (2) new inner casing strings were installed, and two (2) well abandonments were completed.

Work year-to-date June 2024 included two (2) reassessments in progress, one (1) abandonment in progress, four (4) through-tubing inspections completed, one (1) workover recompletion, and one (1) wellhead repair.

The ongoing accumulation of well integrity findings from the surface monitoring and downhole inspections creates additional learning opportunities. The findings of the reassessments suggest to SoCalGas that the reassessment inspection period can be lengthened. As of June 2024, the Company had submitted sixty-six (66) individual requests to CalGEM for such reassessment extensions and received permission from CalGEM to extend the reassessment interval from twenty-four (24) months to 50-60 months on sixty (60) requests (the extensions might have been granted in more than one request on the same well). CalGEM has denied extension of reassessment intervals for six (6) requests.

Risk Assessment Discussions

SoCalGas developed a quantitative framework for storage well risk assessments. At the September 2023 WSOC, members of the WSOC provided the Ombudsman with a summary of Aliso Canyon well risk assessment work, which included preliminary results for ten (10) wells. SoCalGas noted that the likelihood of well failure can be related to specific hazards and threats which are required to be evaluated by PHMSA and CalGEM regulations, and that the ten (10) Aliso Canyon wells generally had comprehensive failure rates in line with general gas storage industry averages. SoCalGas also noted that modeled failures during workovers are a significant contributor to the likelihood of a significant fluid release, but that dual barrier construction, pressure monitoring, casing inspection and repair lead to lower likelihood of fluid release. The

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Ombudsman noted in Annual Report Number 4 – Work of the Safety Ombudsman, in response to Data Request 17-18, at this link: ([Click Here](#)), that many Aliso Canyon wells had increased resistance and resilience to certain threats due to the installation of additional new cemented inner casing strings and/or tubing/packer strings.

The WSOC members also indicated during the September 2023 meeting that development of a qualitative reservoir risk assessment framework was underway.

WSOC members provided a summary update on risk assessment progress to the Ombudsman during the December 2023 WSOC meeting.

WSOC members provided the Ombudsman with an additional update on risk assessment at the June 2024 WSOC meeting and at a follow-up virtual session in late June.

SoCalGas' June 2024 update summarized that preliminary risk assessment has been completed for thirty-five (35) Aliso Canyon facility wells. Some Aliso wells have higher-than-industry average failure potential, with attendant potential for significant fluid release, driven primarily by one or two geohazards – either or both landslide mass movement or fault displacement. Landslide and fault displacement threat levels are elevated at Aliso Canyon due to the inherent geologic features of the geologic framework. However, there is significant variability in well-to-well hazard levels for these two threats, thus the environmental risk related to such threats is site-specific and should not be generalized for all Aliso Canyon wells. Along with landslide and fault displacement threats, threats related to loss of control and loss of containment of fluids during well intervention is a significant risk driver and a threat that can be viewed as interacting with other physical force threats.

The SoCalGas storage well risk assessment model enables the company to compare risk and estimate aggregated risk related to all threats evaluated and to threat-specific risk, or residual risk after single or multiple threats are reduced or removed. The model accounts for well-specific configurations and already in-place monitoring and mitigation. The quantitative capability permits estimation or perspectives of threat interaction as well as identification of the relative levels of threats. The model also permits consequence severity estimation related to the type or mode of well barrier component failure.

WSOC members reported to the Ombudsman that as of June 2024, risk assessment had been completed for thirty-five (35) Aliso Canyon wells with respect to the threats affecting or potentially affecting the wells. More detailed discussion of the Aliso Canyon well integrity risk assessment is found in Annual Report Number 5 – Work of the Safety Ombudsman, previously linked.

WSOC members informed Ombudsman on the outline of the reservoir risk assessment and its qualitative treatment of threats affecting the reservoir – geologic uncertainty, third-party activity, incorrect operations, and outside forces. The Ombudsman made recommendations: a) clarify the definition of a reservoir risk event; b) add pressure-volume-inventory as a threat and specific to Aliso Canyon identify the sensitivity of gas volume per psi as a tool to monitor for reservoir events; and c) evaluate interaction of the pressure-volume-inventory threat with the geologic uncertainty threat. (Refer to Annual Report Number 5 – Recommendations for Improvements Related to Safety and Leak Prevention, linked in [Section III](#) below.)



III. Recommendations for Repairs, Improvements, Policies, and/or Upgrades to The Facility

The Safety Ombudsman maintains a compendium of all recommendation topics by the WSOC and/or the Ombudsman over the past five years, the period over which the Consent Decree has been active. The summary of past and current recommendations and the progress of SoCalGas in response to the recommendations is contained in a Microsoft Excel file which can be found at the following link: [Click Here](#)

The Safety Ombudsman developed several specific safety recommendations for consideration by the WSOC/SoCalGas. These recommendations are contained in Annual Report Number 5 – Recommendations for Improvements Related to Safety and Leak Prevention, available at the following link: [Click Here](#)

No recommendations were made by the WSOC during the July 2023-June 2024 period.

IV. Conduct Periodic Safety Audits (SWOTs) Associated with the Facility

Safety/Procedure Audits/SWOT Analysis

At the December 2023 meeting, a subcommittee of the WSOC presented three (3) options to consider for an audit or SWOT (Strengths-Weaknesses-Opportunities-Threats exercise), including one (1) option for auditing gas standards and two (2) options for SWOT analysis of SIMP chapters. WSOC discussion resulted in selection and voted approval of a safety-related SWOT analysis for SIMP.6 Management of Change.

As of the date of this Report, the SWOT is in progress and outcomes will be summarized in the next cycle's annual reports covering the July 2024 – June 2025 period.

V. California Public Utilities Commission (CPUC) and California Department of Conservation Geologic Energy Management Division (CalGEM) Audit Reports

CalGEM is acting as agent for PHMSA during all mandated safety inspections of the Facility. There has not been a PHMSA/CalGEM audit of the Aliso Canyon facility since February 2023.

On August 31, 2023, the California Public Utilities Commission (CPUC) voted to increase the interim storage limit at the Aliso Canyon natural gas storage facility to 68.6 billion cubic feet (Bcf), still below former maximum capacity of 86.2 Bcf. The CPUC ruling was made, in part, based on the demonstrated recent safety performance of the Aliso Canyon facility as well as on the energy needs and 2023 winter reliability model, which can be found at this link: [Click Here](#)