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ATTACHMENT A

Biennial Assessment Report Inputs and Methods

11/13/2024

Order Instituting Investigation pursuant to Senate Bill 380 to determine the feasibility of minimizing or eliminating the use of the Aliso Canyon natural gas storage facility located in the County of Los Angeles while still maintaining energy and electric reliability for the region.	Investigation 17-02-002

BIENNIAL ASSESSMENT REPORT INPUTS AND METHODS

The biennial assessment report will consist of four analyses – demand reduction analysis, hydraulic flow modeling reliability analysis, gas balance reliability analysis, and economic analysis – described below, and a recommendation based on these analyses and recent events. Revisions to these methodologies may be made per the implementation process discussed in this Decision. The biennial assessment report will recommend either incremental reductions to the Aliso Canyon Natural Gas Storage Facility (Aliso Canyon) maximum inventory level of up to 10 Bcf, no change in maximum inventory, or an increase if the storage field is below its California Geologic Energy Management Division (CalGEM) approved maximum pressure, based on the results of these analyses.[1] The biennial report will be written by the CPUC's

[1] The Aliso Canyon storage limit is currently set at the maximum safety limit established by CalGEM, whose role is to protect public health, safety and the environment in its oversight of the oil, natural gas, and geothermal industries. Thus, in the first biennial report, the recommendation would either be a decrease or no change in maximum inventory. A future

Footnote continued on next page.

Energy Division staff. Energy Division may consult with the California Energy Commission (CEC), California Independent System Operator (CAISO), CalGEM, and the Los Angeles Department of Water and Power (LADWP).

1. DEMAND REDUCTION ANALYSIS

The demand reduction analysis will consist of comparing the forecast peak day gas demand (demand) with the 4,121 MMcfd threshold level (threshold) necessary for considering closure of Aliso Canyon. At intermediate levels of demand between the present level and the threshold, intermediate reductions in the maximum storage level will be considered. If gas demand increases, increases in the maximum storage level will be considered if the storage field is below the CalGEM-authorized maximum pressure.

The demand reduction analysis will report the forecast peak day gas demand for the upcoming year[2] and available future years, the peak day gas demand level(s) shown in previous biennial analyses and adopted maximum storage levels, and the threshold in a table for comparison purposes. The peak gas day demand for the upcoming year and available future years shall be determined using the level reported in the California Gas Report until such time as the California Energy Commission provides an alternative 1-in-10 winter peak gas day forecast for the SoCalGas service territory and the CPUC adopts its use.

biennial report could only recommend an increase if the adopted Aliso Canyon maximum inventory had already decreased below the maximum safety limit.

[2] For example, for the biennial analysis published during 2025, the upcoming year is 2026.

2. HYDRAULIC FLOW MODELING RELIABILITY ANALYSIS

The CPUC's Energy Division staff will perform hydraulic flow modeling to assess gas sufficiency to meet demand on a 1-in-10 peak day in the upcoming winter and the subsequent summer without Aliso Canyon and at various levels of Aliso Canyon inventory. This approach uses Synergi Gas software to model the flows of gas into and within the Southern California Gas Company system to ensure that adequate gas pressure is maintained throughout the day. The primary inputs to this model will be based on Table 1 below and may be updated by Energy Division staff as needed.[3]

Table 1: Gas Sufficiency Analysis Inputs

Row	Input	Source	Input Used For:
1	Forecast peak day demand (non-electric)	California Gas Report, potentially switching to CEC forecast when available, using the Summer High Demand Day for summer and 1-in-10-Year Cold Day for winter. Use the actual highest peak day in the last three years instead, if it was higher than the forecasts, which it has been for summer.	Identifying demand targets
2	Forecast peak day demand for gas to serve electric generation	CPUC gas-fired electric generation forecast for summer peak day; California Gas Report or other source for 1-in-10-Year Cold Day for winter, in consultation with CEC, CAISO and LADWP.	Identifying demand targets

[3] Similar inputs originally included in the Staff Proposal Table 5 at 17-19.

Row	Input	Source	Input Used For:
3	Date of peak demand	Summer: August 15, winter: February 15	Identifying available gas supply
4	Demand variation	Standard deviation of daily gas demand (including for electricity), calculated for each calendar month using historical data from 2010-2019, then used to create a higher standard deviation based on a 95% (1-in-20) confidence interval for the standard deviation itself, thus representing the most variable year in 20 years. Alternative values may be used for comparison or basis years updated after 2024.	Identifying demand targets
5	Change in annual average demand (non-electric)	California Gas Report, potentially switching to CEC forecast when available.	Identifying demand targets
6	Change in annual average demand for gas to serve electric generation	CPUC forecast for summer peak day; California Gas Report or other source for 1-in-10-Year Cold Day for winter, in consultation with CEC, CAISO and LADWP.	Identifying demand targets
7	Hourly demand shape (non-electric)	CPUC forecast, potentially switching to CEC forecast when available.	Identifying demand targets (for hydraulic modeling only)

Row	Input	Source	Input Used For:
8	Hourly demand shape for gas to serve electric generation	CPUC forecast, in consultation with CEC, CAISO and LADWP, potentially switching to CEC forecast when available.	Identifying demand targets (for hydraulic modeling only)
9	Pipeline capacities (constraints on gas pipelines within Southern California)	Actual operating capacities, as reported in advice letters regarding pipeline capacity submitted in compliance with D.22-07-002, less unplanned outage of 101.5 MMcfd for hydraulic flow modeling, less planned outages reported by SoCalGas in twice annual data requests for the gas balance analysis.	Identifying available gas supply
10	Receipt point capacity (constraints on gas entering Southern California)	For hydraulic flow modeling, 85% of the nominal capacity of the Northern and Southern Zones and 100% of the nominal capacity of the Wheeler Ridge Zone. For the gas balance analysis, 100% of SoCalGas' firm contracted capacity or the zonal capacities assumed for the hydraulic flow modeling less planned outages, whichever is lower.	Identifying available gas supply
11	Gas in storage at beginning of season	Estimate based on actual gas in storage at beginning of the current season and subsequent injections/ withdrawals modeled using gas balance reliability analysis methods.	Identifying available gas supply

Row	Input	Source	Input Used For:
12	Maximum gas withdrawal and injection rates for each gas storage field	Annual data request to SoCalGas for forecast daily or monthly withdrawal and injection rates, which vary based on number of wells out of service for maintenance and other storage facility conditions. Current model approach uses monthly rates but may be changed to use daily, since many maintenance activities last 1-3 weeks with specific scheduled dates.	Identifying available gas supply
13	Gas storage field maximum and minimum inventories for non-Aliso Canyon fields	Utility-defined levels, stated in annual confidential data request responses. Below the minimum inventory, there is still gas in storage, but withdrawal rates are lower.	Defining gas supply
14	Aliso Canyon maximum inventory	Varying from current level in steps of approximately 5 Bcf, as needed to find a level where model succeeds.	Defining policy options to be assessed by model
15	Future years modeled	Upcoming winter and subsequent summer seasons and five years later[4]	
16	Maximum allowed imbalance days	<1 day	Defining model success

[4] For example, the first analysis will model November 2025 through March 2026 (winter) and April through October 2026 (summer).

3. GAS BALANCE RELIABILITY ANALYSIS

This analysis will assess the ability of the gas system to meet daily demand using a model that represents daily future gas supply and demand, using a methodology described in previous work as a Feasibility Assessment. The gas balance reliability analysis forecasts demand each day during the winter season using stochastic (random) draws from a demand distribution. This distribution uses historical and forecast data and is designed to represent a cold and dry year, not an average year. The model then seeks to meet that daily demand with gas supplied each day using gas forecast to be available from pipelines and storage. Any day on which demand exceeds supply is identified as an imbalance day. This model is run 100 times, and the results are averaged.

The input assumptions shown in Table 1 will be used.

4. ECONOMIC ANALYSIS

The economic analysis will take note of whether natural gas prices for the upcoming winter are above specified levels. If prices are above the threshold levels, the biennial assessment may recommend that the Aliso Canyon storage level remain unchanged or be increased to mitigate the rate impacts of high Southern California gas prices.

1. If the price of natural gas in Southern California for the upcoming winter is 50 percent or more above the Henry Hub price of natural gas for the upcoming winter, then the biennial assessment conducted that year will not recommend reducing the storage level at Aliso Canyon during the two-year period covered by the biennial assessment.
    a. For this calculation, the Southern California gas price for the upcoming winter will be represented by the SoCal Citygate average forward fixed price of gas, or its successor, for the upcoming December, January, and

February, as published by Natural Gas Intelligence, averaged across the values published on each date from March 1 through May 31 of the year when the biennial assessment is published.

b. For this calculation, the national gas price for the upcoming winter will be represented by the Henry Hub average forward price of gas, or its successor, for the upcoming December, January, and February, published by Natural Gas Intelligence, averaged across the values published on each date from March 1 through May 31 of the year when the biennial assessment is published.

2. If the forward price of gas in Southern California for the upcoming winter is 50 percent or more above the bidweek price of gas in Southern California during the previous three winters, the biennial assessment conducted that year will recommend not reducing the maximum storage level at Aliso Canyon during the two-year period covered by the biennial assessment.

    a. For this calculation, the Southern California gas price for the upcoming winter will be represented as described in 1.a. above.

    b. For this calculation, the Southern California bidweek price of gas during the previous three winters will be represented by the SoCal Citygate average bidweek price, or its successor, as published by Natural Gas Intelligence, averaged across the values for December, January, and February delivery in the preceding three years.

3. December 2022 will be excluded from these analyses, because it represents an exceptional data point.

(END OF ATTACHMENT A)