

February 27, 2019

The California Public Utilities Commission, Energy Division was notified by Southern California Gas Company of Aliso Canyon withdrawals at approximately 8:35 PM on February 26, 2019. This posting will be updated with a report containing more information as soon as possible.

February 28, 2019

The California Public Utilities Commission, Energy Division was notified by Southern California Gas Company that withdrawals from Aliso Canyon ceased at approximately 12:03 PM on February 27, 2019.

The data request required within 24 hours of the cessation of a withdrawal from Aliso Canyon has been provided by SoCalGas and is attached below.

March 29, 2019

The data request required within 30 days of the cessation of a withdrawal from Aliso Canyon has been provided by SoCalGas and is attached below.

SOUTHERN CALIFORNIA GAS COMPANY
ALISO CANYON WITHDRAWAL PROTOCOL (11-2-17)
SOCALGAS RESPONSE TO CPUC-ENERGY DIVISION
DATED FEBRUARY 28, 2019

Public Version

Question 1:

Pursuant to the Aliso Canyon Withdrawal Protocol dated November 2, 2017, SoCalGas shall within 24 hours of cessation of a withdrawal from Aliso Canyon, provide the Energy Division of the CPUC:

- a. the total and hourly withdrawals from the field;
- b. the number of wells used for making withdrawals and the SoCalGas identifier for each well used;
- c. the pre- and post-withdrawal Aliso working gas inventory;
- d. the hourly pipeline receipts for the calendar day(s) on which a withdrawal was made and the day immediately preceding the withdrawal;
- e. the hourly withdrawals by field from non-Aliso storage facilities for the calendar day(s) on which a withdrawal was made and the day immediately preceding the withdrawal;
- f. information concerning any anomalies experienced during the operation of the field;
- g. any repairs or mitigation required as a result of the withdrawal, including the time necessary to make them before another withdrawal could be made and the impact on the field's injection and withdrawal capacity;
- h. whether the withdrawal was made under conditions identified in 1.B.

Response 1:

SoCalGas provides the following response with respect to the withdrawal of gas from Aliso Canyon that began at approximately 8:35 pm on February 26, 2019 and ceased at approximately 12:03 pm on February 27, 2019.

- a. The total withdrawal from the field was 0.27 Bcf. The hourly withdrawals from the field are provided in the table below. Inventory volumes are based on Gas Control system data and are subject to adjustment based on SoCalGas' routine monthly reconciliation between real-time SCADA system data, and the measurement data recorded by our Measurement Data Operations (MDO) department. SoCalGas will update this response following the reconciliation process, if appropriate.

SOUTHERN CALIFORNIA GAS COMPANY
ALISO CANYON WITHDRAWAL PROTOCOL (11-2-17)
SOCALGAS RESPONSE TO CPUC-ENERGY DIVISION
DATED FEBRUARY 28, 2019

Public Version

Date / Time	Hourly Withdrawal (MMCF)
2/26/2019 20:00	
2/26/2019 21:00	
2/26/2019 22:00	
2/26/2019 23:00	
2/27/2019 0:00	
2/27/2019 1:00	REDACTED
2/27/2019 2:00	
2/27/2019 3:00	
2/27/2019 4:00	
2/27/2019 5:00	
2/27/2019 6:00	
2/27/2019 7:00	
2/27/2019 8:00	
2/27/2019 9:00	
2/27/2019 10:00	
2/27/2019 11:00	
2/27/2019 12:00	
2/27/2019 13:00	

- b. 42 wells were used for making withdrawals. Please see the attached spreadsheet.

REDACTED

- c. The pre- and post-withdrawal Aliso working gas inventory were 20.37 Bcf and 20.10 Bcf, respectively.

Inventory volumes are based on Gas Control system data and are subject to adjustment based on SoCalGas' routine monthly reconciliation between real-time SCADA system data, and the measurement data recorded by our Measurement Data Operations (MDO) department. SoCalGas will update this response following the reconciliation process, if appropriate.

SOUTHERN CALIFORNIA GAS COMPANY
ALISO CANYON WITHDRAWAL PROTOCOL (11-2-17)
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Public Version

- d. The hourly pipeline receipts for the calendar days on which a withdrawal was made and the calendar day immediately preceding the withdrawal, is provided in the attached spreadsheet.

REDACTED

Pipeline receipt data is based on Gas Control system data and are subject to adjustment based on SoCalGas' routine monthly reconciliation between real-time SCADA system data, and the measurement data recorded by our Measurement Data Operations (MDO) department. SoCalGas will update this response following the reconciliation process, if appropriate.

- e. The hourly withdrawals by field from non-Aliso storage facilities for the calendar days on which a withdrawal was made and the calendar day immediately preceding the withdrawal are provided in the attached spreadsheet.

REDACTED

Inventory volumes are based on Gas Control system data and are subject to adjustment based on SoCalGas' routine monthly reconciliation between real-time SCADA system data, and the measurement data recorded by our Measurement Data Operations (MDO) department. SoCalGas will update this response following the reconciliation process, if appropriate.

- f. **REDACTED**

- g. **REDACTED**

- h. No.

**SOUTHERN CALIFORNIA GAS COMPANY
30-Day Aliso Canyon Withdrawal Report
Response Dated March 29, 2019**

PUBLIC VERSION

Purpose

On November 2, 2017, the Energy Division of the California Public Utilities Commission (“CPUC-ED”) issued the Aliso Canyon Withdrawal Protocol (“Withdrawal Protocol”). The Withdrawal Protocol specifies the circumstances and conditions when Southern California Gas Company (“SoCalGas”) may execute a withdrawal operation from the Aliso Canyon storage field. In addition, the Withdrawal Protocol contains certain noticing and reporting requirements, including the following:

Within 30 days after a withdrawal, SoCalGas shall provide the Energy Division with a full description of the events and conditions leading up to the withdrawal, all actions taken prior to the withdrawal, and any observations or recommendations concerning the execution of future withdrawals. Further, SoCalGas shall identify and describe any steps or actions not taken that could have diminished or eliminated the need for a withdrawal and make comments and/or recommendations for future consideration.¹

Pursuant to the Withdrawal Protocol, SoCalGas provides the following 30-day report with respect to the withdrawals from Aliso Canyon that occurred between February 26, 2019 and February 27, 2019.

Background

Withdrawals from Aliso Canyon were based on forecasted and known conditions including but not limited to weather, overall gas demand, electric generation gas demand, and the current and anticipated operating condition of the SoCalGas system.

Actions Taken Prior to (and During) the Withdrawal

Curtailement Actions

Per the Withdrawal Protocol, SoCalGas took actions available to meet demand and to avoid curtailments including working with the Balancing Authorities (the California Independent System Operator [CAISO] and the Los Angeles Department of Water and Power [LADWP]) to reduce or limit electric generation demand through requests for voluntary curtailments. Coordination took place between SoCalGas and the Balancing Authorities during this period, having multiple interactions per day with both management and the real-time control room operators to manage the system reliability of three energy delivery systems (CAISO, LADWP, and SoCalGas) in near real-time.

¹ CPUC-ED Aliso Canyon Withdrawal Protocol dated 11/2/2017, page 3.

ENVOY Critical Notices

The table below summarizes the SoCalGas ENVOY® (ENVOY) Critical Notices posted during this event.

Notice Date	Summary of Notice (Times stated are in Pacific Time)						
02/27/2019	Issued system-wide voluntary curtailment of electric generation effective from February 26, 2019 at approximately 8:17 PM through February 27, 2019 at 11:59 PM.						
02/27/2019	Notified customers of the continuous work to restore Aliso Canyon’s withdrawal capabilities and that an outage reduced Aliso Canyon’s net current withdrawal capacity by 250 MMCFD.						
02/27/2019	Notified customers that the system-wide voluntary curtailment of electric generation that was effective on February 26, 2019 at approximately 8:17 PM ended on February 27, 2019 at 12:00 PM.						
02/28/2019	Notified customers of the times of initiation and cessation of withdrawal at Aliso Canyon – Gas Day ² February 26, 2019 at approximately 8:35 PM and Gas Day February 27, 2019 at approximately 12:03 PM – as well as the withdrawal volumes for each Gas Day in that period.						
	<table border="1"> <thead> <tr> <th>Gas Day</th> <th>Aliso Canyon Withdrawal Volume (BCF)</th> </tr> </thead> <tbody> <tr> <td>02/26/2019</td> <td>0.239 BCF</td> </tr> <tr> <td>02/27/2019</td> <td>0.028 BCF</td> </tr> </tbody> </table>	Gas Day	Aliso Canyon Withdrawal Volume (BCF)	02/26/2019	0.239 BCF	02/27/2019	0.028 BCF
	Gas Day	Aliso Canyon Withdrawal Volume (BCF)					
	02/26/2019	0.239 BCF					
02/27/2019	0.028 BCF						

Operational Flow Orders, Restricted Maintenance Operations, Dial-It-Down Alerts, and Smart Therm Demand Response Events

There were no low Operational Flow Orders (low OFOs), Restricted Maintenance Operations (RMOs), Dial-It-Down alerts, or Smart Therm Demand Response events on February 26, 2019 or February 27, 2019.

SoCalGas did not call a low OFO on either February 26 or 27 because the forecast storage withdrawal for system balancing did not exceed the withdrawal capacity allocated for this purpose. The declaration of a low OFO is based on a daily calculation completed by ENVOY that determines whether the system forecast of storage withdrawal used for balancing exceeds the withdrawal capacity allocated to the balancing function (details of this calculation are available in ENVOY).

² A Gas Day is from 7:00 AM to 7:00 AM

SoCalGas did not call an RMO at the time of Aliso Canyon’s withdrawal due to the expected short duration of this event. Also, there was no pipeline work being performed that would have affected system capacity on the night of February 26 into the early morning of February 27. The need for an RMO could have been re-assessed in the morning if the event appeared to be lasting longer than expected.

SoCalGas determined that it would not be effective to use a Dial-it-Down alert and/or Smart Therm demand response during this event because of (1) the warmer temperatures, (2) the risk of customer fatigue and negative response, (3) the expected short duration of the event, and (4) because some of the load was attributed to the electric generation hourly demand which would not have been affected by the SoCalGas demand response or gas conservation programs.

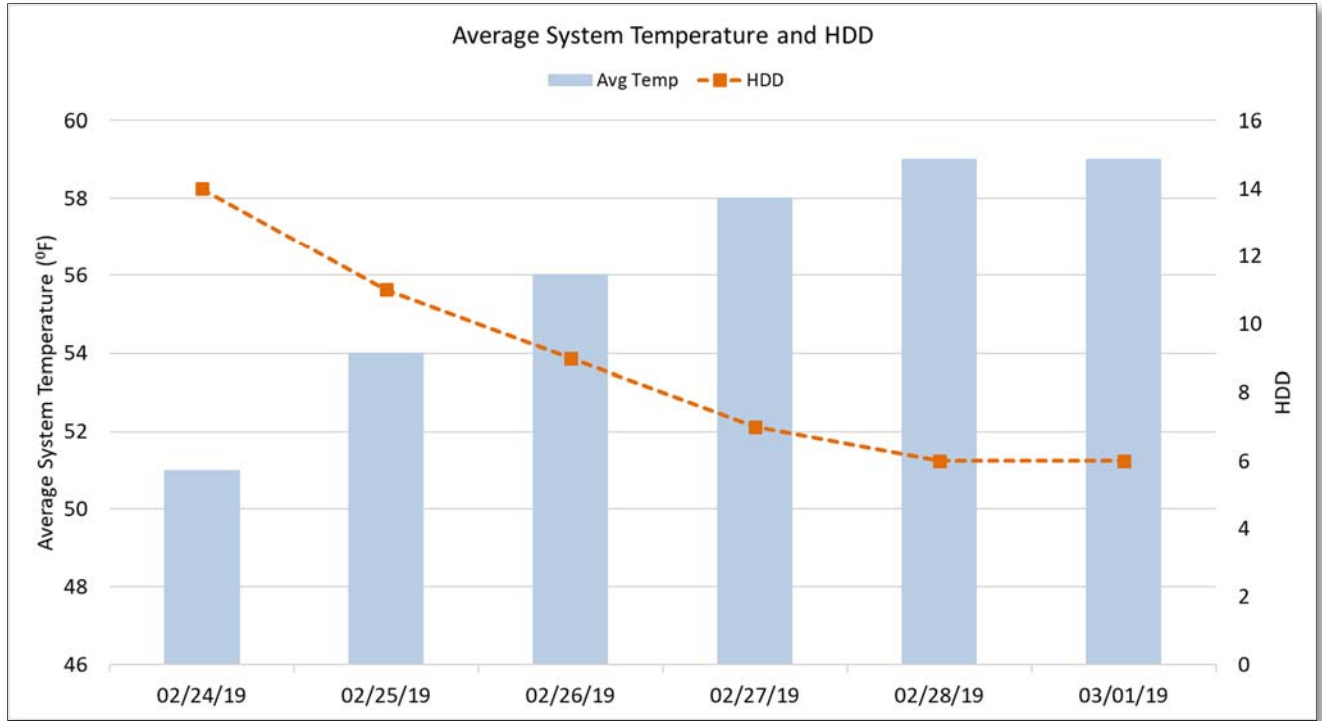
Events and Conditions Leading Up to (and During) the Withdrawal

Weather

The graph below shows the system average heating degree days³ (“HDD”) and the daily custom system average temperatures⁴ for the SoCalGas and SDG&E service territories, from February 24, 2019 through March 1, 2019. The average temperatures during this event were in the upper 50s. The core load was forecasted to decrease throughout the week given the warming temperature trend.

³ An HDD is a measurement designed to quantify the demand for energy needed to heat a building. It is the number of degrees that a day’s average temperature is below 65° Fahrenheit, which is the temperature below which buildings need to be heated.

⁴ The custom system average temperature calculation incorporates data from 12 weather stations across the SoCalGas and SDG&E service territories and is provided by calendar day.



Status of Storage Fields

In accordance with the Withdrawal Protocol, SoCalGas has placed greater reliance on its non-Aliso Canyon storage fields (Honor Rancho, La Goleta, and Playa del Rey) to meet customer demand since the beginning of the winter season on November 1, 2018. This reliance on the non-Aliso Canyon storage fields for the 2018-19 winter season has resulted in lower inventory levels at the non-Aliso Canyon fields and in turn led to significantly reduced available withdrawal capacities.

In addition, SoCalGas’ safety enhancements and integrity assessments at the storage fields have reduced SoCalGas’ system-wide withdrawal capacity because wells have been taken offline for mechanical integrity testing and conversion to tubing-only flow. This too has resulted in decreased storage withdrawal capabilities.

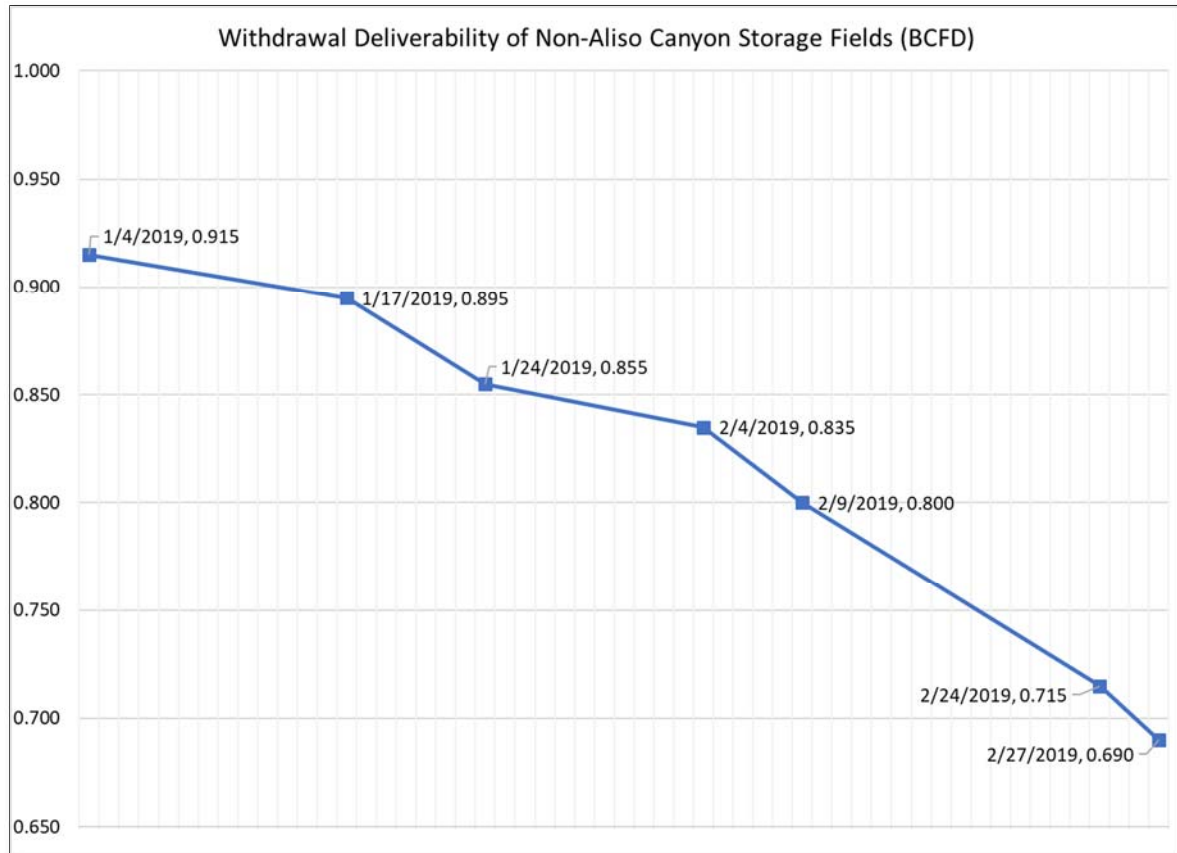
The table below provides the approximate inventories and withdrawal capacities of each of the storage fields at the beginning and end of the event.

Storage Field	Beginning of Gas Day Feb 26, 2019 Inventory (BCF)	Gas Day Feb 26, 2019 Withdrawal Capacity (MMCFD)	Beginning of Gas Day Feb 27, 2019 Inventory (BCF)	Gas Day Feb 27, 2019 Withdrawal Capacity (MMCFD)
Aliso Canyon	20.418		20.131	
Honor Rancho				
La Goleta				

Playa Del Rey			
Total Storage W/O Aliso	690	18.907	690
Total Storage W/ Aliso			

Non-Aliso Canyon Storage Field Withdrawal Deliverability (Withdrawal Capacity)

The graph below shows the decreasing withdrawal deliverability of the non-Aliso Canyon storage fields.



Flowing Pipeline Capacity & Supplies

The table below shows the average available pipeline flowing supply capacity and scheduled quantity from Gas Day February 26, 2019 through Gas Day February 27, 2019. The higher percentage in capacity utilization is likely due to capacity constraints.

Gas Day February 26, 2019 – Gas Day February 27, 2019			
	Average Available Pipeline Flowing Supply Capacity (MMCFD)	Average Scheduled Pipeline Flowing Supply Quantity (MMCFD)	Average Percent Capacity Utilization
Total System	2,722	2,602	95.6%

Total System Receipts vs. Total System Demand

Gas Day February 26 was forecasted in the morning to be approximately 3.0 BCF in total system demand, but the day resulted in a higher than expected total system demand of 3.2 BCF, with flowing pipeline receipts coming in at approximately 2.5 BCF.

The table below shows the total system receipts and demand for Gas Day February 26 and Gas Day February 27. As noted in the table below, the withdrawal volume required to balance customer supply and demand on Gas Day February 26 nearly equaled the volume that could be supplied by the non-Aliso Canyon storage fields. Note that system reliability considers the combination of meeting the total gas day system demand along with meeting the peak hourly demands, as discussed in the next section.

Gas Flow Date	Total Receipts (MMCF)	System Demand (MMCF)	Volume of gas that must be supplied by storage withdrawal (MMCF).⁵	Aliso Canyon Storage Field Withdrawal Capacity (MMCFD)	Non-Aliso Canyon Storage Field Withdrawal Capacity (MMCFD)
02/26	2,543	3,164	620		690
02/27	2,669	2,942	273		690

Available Supply vs. Hourly Demand

The table below compares the pipeline flowing supplies and available storage withdrawals to the peak hourly demands that occurred on the morning and evening of February 26, 2019, and the morning of February 27, 2019. When the sum of pipeline flowing supplies and the available storage field withdrawal is exceeded by the peak hourly demand, the system must use line pack (the system must draft) to make up the difference.⁶

On February 26, 2019 the morning peak hourly demand reached 199 MMCFH. This high peak demand period made it difficult for the system to recover linepack while heading into the February 26, 2019 evening peak hourly demand of 165 MMCFH. As a result, the non-Aliso Canyon storage fields were on maximum withdrawal for many hours that day.

⁵ A small amount of linepack may be used in lieu of storage withdrawal on one gas day to meet system demand, but the linepack must be replaced the following gas day by additional storage withdrawals to ensure the peak hourly demand can be managed.

⁶ The system is packing when available pipeline flowing supplies plus storage withdrawal exceeds the real-time send out. The system is drafting when the real-time sendout exceeds available pipeline flowing supplies plus storage withdrawal. When allowed to appropriately prepare for the peak sendout periods, the SoCalGas system typically has approximately [REDACTED] in available draft supplies that can be used to meet the real-time sendout. For example, if the system is drafting approximately [REDACTED] and the system has [REDACTED] pack available at the start of the peak period, the system could sustain reliability for approximately 3-4 hours.

Date	Average Pipeline Flowing Supplies During Ramp (MMCFH)	Available non-Aliso Canyon Storage Withdrawal Capacity During Ramp (MMCFH)	Available Aliso Canyon Storage Withdrawal Capacity During Ramp (MMCFH)	Ramping Period (HRS)*	Hourly Demand at Start of Ramp (MMCFH)	Morning and Evening Peak Hourly Demand (MMCFH)	Peak Hourly Demand minus [Flowing Supplies plus non-Aliso Canyon Withdrawal Capacity] ⁷ (MMCFH)	Calculated Draft (Pack). Peak Hourly Demand minus [Flowing Supplies plus Aliso Cyn & Non-Aliso Cyn Withdrawal Capacity] ⁸ (MMCFH)
02/26	107	29		8	98	199	63	Aliso Canyon was not on withdrawal during the morning peak
02/26	107	29		7	114	165	29	
02/27	91	29		5	85	170	50	

On February 26, from approximately 8:00 AM (end of the February 26 morning peak demand period) through approximately 3:00 PM (beginning of the February 26 evening ramp), as the system demand was trending downward, the average demand was approximately 133 MMCFH and the average flowing supplies was 108 MMCFH. Considering the non-Aliso Canyon storage fields' combined available withdrawal capacity of 29 MMCFH, an average pack rate of only 4 MMCFH was all that was possible during this period. During these non-peak hours, the electric generation (EG) hourly demand was high along with the core customer demand also being higher than forecasted that day.

In the evening, peak hourly EG demand rate reached approximately 44 MMCFH during 6-7 PM where the day before the peak hourly rate was approximately 34 MMCFH for the same period.

Because of the overall, high hourly customer demand throughout the morning of February 26, midday, and moving into the evening hours, it was determined that the system could neither sustain nor recover the desired linepack with only non-Aliso Canyon storage fields. Therefore, Aliso Canyon was put on withdrawal on the evening of February 26, 2019 at approximately 8:35pm.

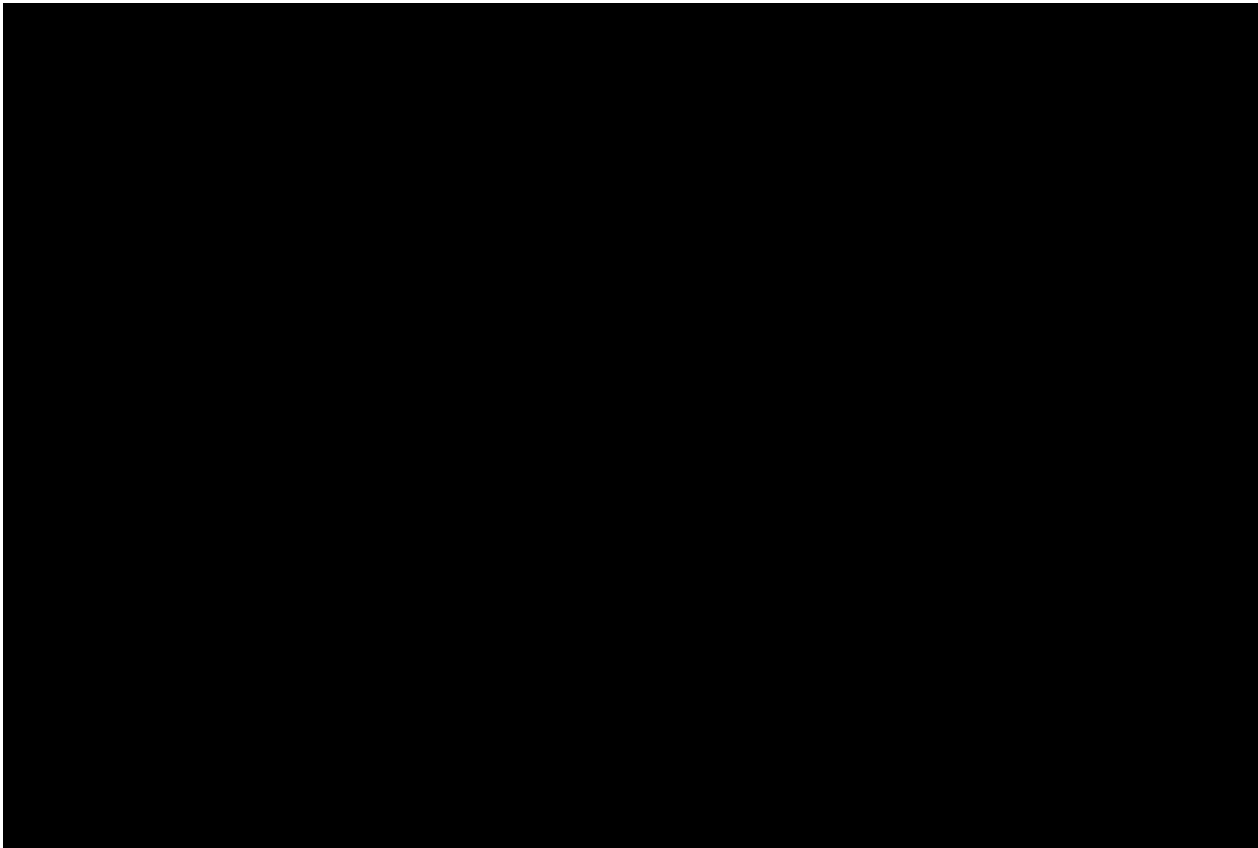
Aliso Canyon and Non-Aliso Canyon Withdrawals for each Gas Day

The table and graph below show Aliso Canyon and non-Aliso Canyon withdrawals throughout this event.

⁷ Next to last column explanation: If the calculated number is less than or equal to zero, that means the peak hourly demand could be met with flowing supplies plus withdrawals from non-Aliso Canyon storage fields.

⁸ Last column explanation: If the calculated number is less than or equal to zero, that means the peak hourly demand could be met with flowing supplies plus withdrawals from all four storage fields.

Gas Day	Aliso Canyon Withdrawal (BCF)	Non-Aliso Canyon Withdrawal (BCF)
02/26	0.239	
02/27	0.028	



Storage Fields' Remaining Inventories

The table below compares the remaining inventories for each storage field at the end of the withdrawal period to their respective February month-end minimum inventory requirements, as stated in the 2018-19 Winter Technical Assessment. Honor Rancho had just over [REDACTED] remaining and Playa Del Rey was [REDACTED]. The table below also provides the total withdrawal of each storage field from Gas Day February 26 through Gas Day February 27.

Storage Field	February 2019 Month-End Minimum (BCF)	Approximate Inventory Remaining at End of Withdrawal, Feb 27 (BCF)	Withdrawal from Gas Day Feb 26 through Gas Day Feb 27 (BCF)	Inventory Remaining Minus Month-End Minimum (BCF)
Aliso Canyon	3.8	20.131	0.267	16.331
Honor Rancho	7.5			
La Goleta	7.6			
Playa Del Rey	1.1			

Additional Steps or Actions That Could Have Reduced or Eliminated the Need for Withdrawal

As previously stated, SoCalGas proactively worked with the Balancing Authorities during the day of the event to determine if the level of the on-system generation demand could be reduced prior to withdrawing gas supply from Aliso Canyon. As per the Withdrawal Protocol, SoCalGas withdrew gas from Aliso Canyon when the amount by which the Balancing Authorities could voluntarily curtail demand was insufficient to resolve the shortage of natural gas. SoCalGas could have further curtailed customer demand to reduce or eliminate the need to withdraw gas supply from Aliso Canyon. Per SoCalGas Rule No. 23 and SDG&E Rule No. 14, electric generation demand not necessary to maintain grid reliability is to be curtailed first, followed by other noncore customer demand, and then the remaining electric generation demand. SoCalGas does not consider this to be a reasonable action to reduce or eliminate the need to withdraw gas supply from Aliso Canyon.

Observations and Recommendations

The event discussed above highlights a number of items or observations regarding SoCalGas’ system, assets, and customer demand.

- Comparing non-Aliso Canyon storage inventory levels between now and around this time last year, there is less inventory in those fields this year. In order to manage storage inventory and preserve withdrawal deliverability at the non-Aliso Canyon storage fields, SoCalGas plans to withdraw gas from Aliso Canyon consistent with the Aliso Canyon Withdrawal Protocol. Preserving these storage inventories at the non-Aliso Canyon storage fields is critical in meeting forecasted customer daily and hourly demand and in mitigating the risk of further gas curtailments this winter. In a letter written to the Commission on January 8, 2019, SoCalGas explained that it may withdraw gas from Aliso Canyon to (1) meet immediate high customer demands; (2) limit withdrawals at Honor Rancho to an average of 90 MMCFD per day for the remainder of January; and (3) restore Playa Del Rey inventory. In the middle of February 2019, SoCalGas began to target limits to Honor Rancho withdrawal at 200 MMCF per day, when possible,

for the remainder of February, to prevent going below the monthly minimum inventory level set in the 2018-19 Winter Technical Assessment.

- Although SoCalGas' non-Aliso Canyon storage fields play a significant role in supporting reliability of the gas system, they cannot always provide the necessary reliability during significant events. Because of its size, its physical location on SoCalGas' transmission system, and its withdrawal capacity, Aliso Canyon storage field plays a key role in preventing customer curtailments and protecting the integrity of the SoCalGas system. SoCalGas will be producing its 2019 Summer Technical report which focuses on the injection projections for each of the storage fields. It will be a priority to build back up the storage inventories, which are currently extremely low to near max levels, to provide reliability for customers in the 2019-2020 winter season.
- The high demand placed on the system during this event further supports eliminating or modifying the Withdrawal Protocol to allow Aliso Canyon to increase system flexibility, increase system reliability, and add to available supplies more strategically.