

March 11, 2019

The California Public Utilities Commission, Energy Division was notified by Southern California Gas Company of Aliso Canyon withdrawals at approximately 7:45 AM on March 11, 2019. This posting will be updated with a report containing more information as soon as possible.

March 13, 2019

The California Public Utilities Commission, Energy Division was notified by Southern California Gas Company that withdrawals from Aliso Canyon ceased at approximately 6:52 AM on March 12, 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.

April 11, 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.



Troy A. Bauer
Pipeline Safety and Compliance
Manager
555 W. Fifth Street, ML11A6
Los Angeles, CA 90013
Phone: 909-376-7208

March 11, 2019

Edward Randolph
Director, Energy Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, California 94102

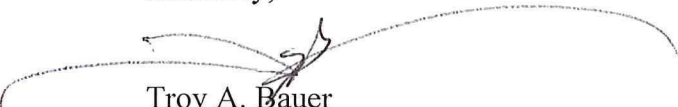
RE: Aliso Canyon Withdrawal Protocol Notification

Dear Mr. Randolph:

Pursuant to the Aliso Canyon Withdrawal Protocol dated November 2, 2017 (Protocol), I am writing to inform you that SoCalGas initiated withdrawal of natural gas from the Aliso Canyon storage field at approximately 7:45 AM on March 11, 2019. SoCalGas will immediately notify you when withdrawal of natural gas from the Aliso Canyon storage field has ceased. Pursuant to the Protocol, SoCalGas will provide information regarding the withdrawal event to the Energy Division within 24 hours of the withdrawal event's cessation.

Please let me know if you have any questions.

Sincerely,



Troy A. Bauer
Pipeline Safety and Compliance

cc: Simon Baker, Energy Division, CPUC
Dorothy Duda, Energy Division, CPUC
Jean Spencer, Energy Division, CPUC
Renee Guild, Energy Division, CPUC
Christina Ly, Energy Division, CPUC
Judith Ikle, Energy Division, CPUC
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Kenneth Bruno, Safety and Enforcement Division, CPUC
Matthewson Epuna, Safety and Enforcement Division, CPUC
Lana Tran, Safety and Enforcement Division, CPUC

SOUTHERN CALIFORNIA GAS COMPANY
ALISO CANYON WITHDRAWAL PROTOCOL (11-2-17)
SOCALGAS RESPONSE TO CPUC-ENERGY DIVISION
DATED MARCH 12, 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 7:55 am on March 11, 2019 and ceased at approximately 6:52 am on March 12, 2019.

- a. The total withdrawal from the field was 0.31 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.

Date / Time	Hourly Withdrawal (MMCF)
3/11/2019 7:00	
3/11/2019 8:00	
3/11/2019 9:00	

SOUTHERN CALIFORNIA GAS COMPANY
ALISO CANYON WITHDRAWAL PROTOCOL (11-2-17)
SOCALGAS RESPONSE TO CPUC-ENERGY DIVISION
DATED MARCH 12, 2019

Public Version

Date / Time	Hourly Withdrawal (MMCF)
3/11/2019 10:00	
3/11/2019 11:00	
3/11/2019 12:00	
3/11/2019 13:00	
3/11/2019 14:00	
3/11/2019 15:00	
3/11/2019 16:00	
3/11/2019 17:00	REDACTED
3/11/2019 18:00	
3/11/2019 19:00	
3/11/2019 20:00	
3/11/2019 21:00	
3/11/2019 22:00	
3/11/2019 23:00	
3/12/2019 0:00	
3/12/2019 1:00	
3/12/2019 2:00	
3/12/2019 3:00	
3/12/2019 4:00	
3/12/2019 5:00	
3/12/2019 6:00	
3/12/2019 7:00	

b. 51 wells were used for making withdrawals. Please see the attached spreadsheet.

REDACTED

c. The pre- and post-withdrawal Aliso working gas inventory were 19.83 Bcf and 19.52 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)

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

department. SoCalGas will update this response following the reconciliation process, if appropriate.

- 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 April 11, 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 March 11, 2019 and March 12, 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 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 Pacific Time)
03/10/2019	Issued a system-wide voluntary curtailment of electric generation effective from March 11, 2019 at 12:00 AM through March 11, 2019 at approximately 11:59 PM.
03/11/2019	Notified customers that the system-wide voluntary curtailment of electric generation that was effective on March 11, 2019 at 12:00 AM was being extended through March 12, 2019 at 11:59 PM.
03/12/2019	Notified customers that the system-wide voluntary curtailment of electric generation that was effective on March 11, 2019 at 12:00 AM would end on March 12, 2019 at 12:00 PM.
03/12/2019	Notified customers of the times of initiation and cessation of withdrawal at Aliso Canyon – Gas Day ² March 11, 2019 at approximately 7:55 AM and Gas Day March 11, 2019 at approximately 6:52 AM – as well as the Aliso Canyon withdrawal volume for that Gas Day which was 0.314 BCF.

Operational Flow Orders

Customers are responsible for scheduling and delivering gas supplies to the SoCalGas and San Diego Gas and Electric (“SDG&E”) system to meet their usage. SoCalGas has few tools besides its storage fields to manage the mismatch between what customers bring onto the system in supplies and their usage. SoCalGas must rely on regulatory tools in place to try to manage the system’s reliability, integrity, and safety. These tools include the low operational flow order (“low OFO”), the high operational flow order (“high OFO”), the emergency flow order (“EFO”), and curtailment procedures. The table below shows the Low OFO declarations during this event.

Low OFO Declarations For each Gas Day		
03/11/2019	Stage 3	-5%

Dial-It-Down Alerts

SoCalGas issued a Dial-It-Down alert and it was effective from March 10, 2019 through March 12, 2019. Southern Californians were encouraged to conserve natural gas.

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

Smart Therm Demand Response Events

There were no Smart Therm Demand Response events from March 11, 2019 through March 12, 2019. SoCalGas did not use a Smart Therm demand response during this event because the morning and evening temperatures on March 11 were forecasted to be moderate and negative response from customers was expected to be high given these moderate temperature conditions.

Restricted Maintenance Operations

Gas Control declared restricted maintenance operations from March 11, 2019 at 7:00 AM through March 12, 2019 at 7:00 AM.

Gas Control declared restricted maintenance operations at transmission pipeline compressor stations, transmission pipelines, and storage facilities, noting anticipated higher customer demand which was expected to stress the gas system given the non-Aliso Canyon storage fields' limited, aggregate withdrawal capacity. This anticipated high system demand combined with pipeline outages increased the risk of jeopardizing system integrity and thus required all other facilities to be ready and available to maintain system integrity. Maintenance personnel were instructed to request clearance before performing any maintenance that could possibly impact station or pipeline operations.

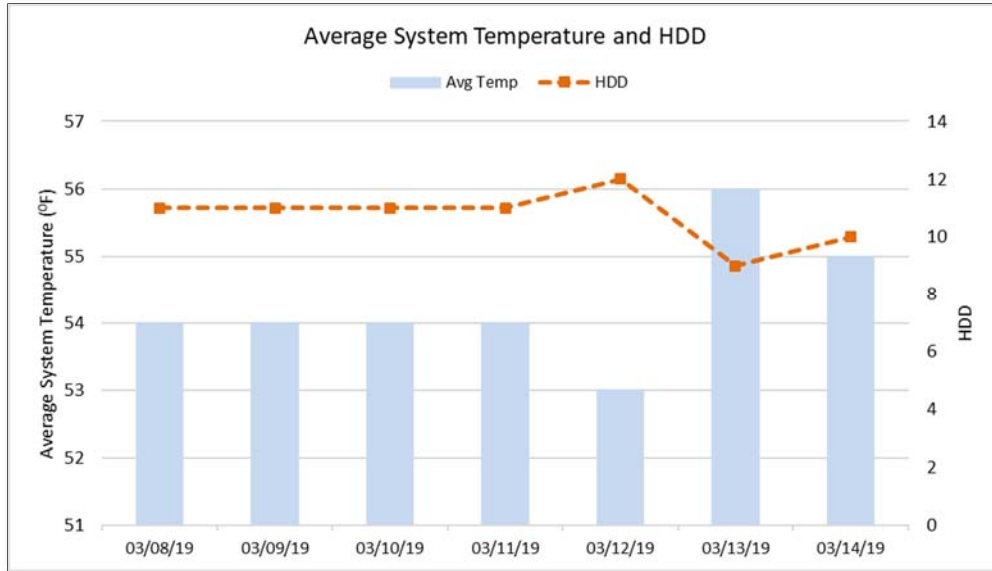
Events and Conditions Leading Up to (and During) the Withdrawal

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 March 8, 2019 through March 14, 2019. From March 8 through March 11, the temperatures had been moderate with a slight dip in temperatures on March 12. March 11 experienced a higher daily customer demand relative to the remainder of the work week. This higher demand is typical for Mondays.

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.

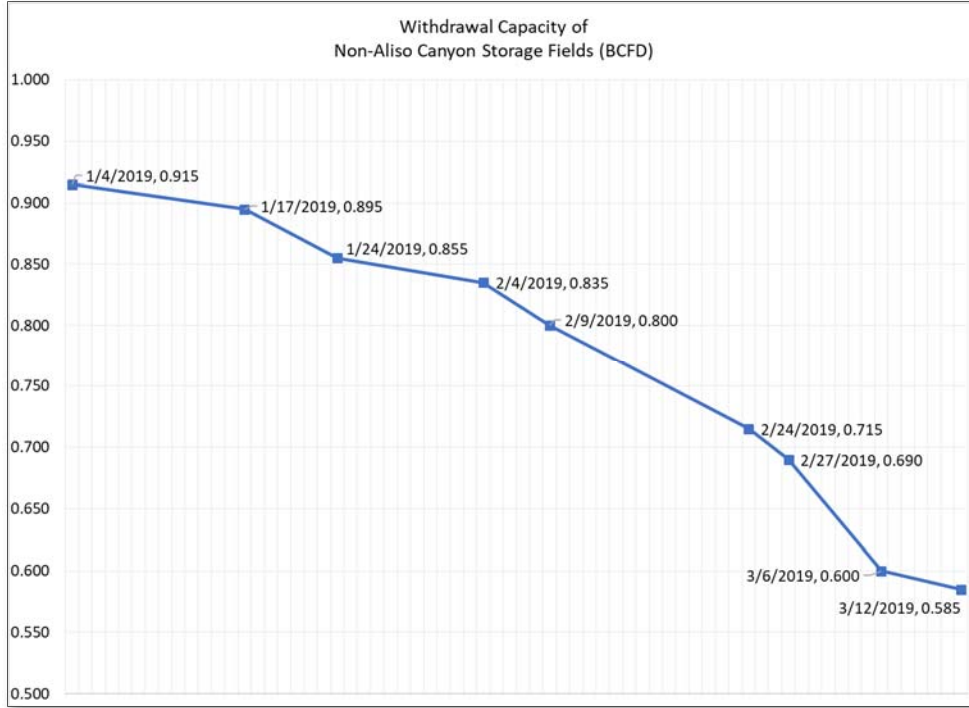
In addition, SoCalGas’ safety enhancements and integrity assessments at the storage fields have reduced SoCalGas’ system-wide withdrawal capacity because wells have been taken offline for mechanical integrity testing and conversion to tubing-only flow. This too has resulted in decreased storage withdrawal 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 Mar 11, 2019 Inventory (BCF)	Beginning of Gas Day Mar 11, 2019 Withdrawal Capacity (MMCFD)	Beginning of Gas Day Mar 12, 2019 Inventory (BCF)	Beginning of Gas Day Mar 12, 2019 Withdrawal Capacity (MMCFD)
Aliso Canyon	19.833		19.519	
Honor Rancho				
La Goleta				
Playa Del Rey				
Total Storage W/O Aliso		600	15.748	585
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. This reduction in withdrawal capacity means that it is increasingly difficult for the non-Aliso Canyon storage fields to manage higher average demand days in both total gas day demand and hourly gas demand.



Flowing Pipeline Capacity & Supplies

The table below shows the average available flowing supply capacity and the average scheduled quantity for Gas Day March 11, 2019. The higher percentage in capacity utilization is likely due to capacity constraints.

Gas Day March 11, 2019			
	Average Available Pipeline Flowing Supply Capacity (MMCFD)	Average Scheduled Pipeline Flowing Supply Quantity (MMCFD)	Average Percent Capacity Utilization
Gas Day March 11	2,698	2,598	96.3%

Total System Receipts vs. Total System Demand

The table below shows the total system receipts and demand for Gas Day March 11. Gas Day March 11 had a narrow margin between what the non-Aliso Canyon storage fields could supply combined with the available pipeline flowing supplies, and the daily system demand (3,167

MMCFD vs. 3,102 MMCFD). A narrow margin for this event means that it was likely that there would not be enough gas supply (pipeline supplies and non-Aliso Canyon storage withdrawals) to pack the system adequately before a morning or evening peak period. System reliability was determined to be at risk without the use of Aliso Canyon.

Gas Day	Total Daily Supply (MMCF)	Total Daily 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)
03/11	2,567	3,102	535		600

Available Supply vs. Hourly Demand

The table below compares the pipeline flowing supplies and available storage supplies to the peak hourly demands during this event. When the sum of pipeline flowing supplies and the available storage field withdrawal is exceeded by the peak hourly demand, the system must use linepack (the system must draft) to make up the difference.⁶

On the morning of March 11, the peak hourly demand was high, at approximately 203 MMCFH. The system would have been drafting nearly ■MMCFH to accommodate this peak hourly demand. The overall morning peak demand period could not be accommodated by flowing supplies plus all available non-Aliso Canyon storage field withdrawals and was forecasted to potentially lower the system inventory to levels that would make it difficult to maintain the required minimum operating pressures in the system and/or recover the necessary line pack before the evening event. System reliability was determined to be at risk.

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

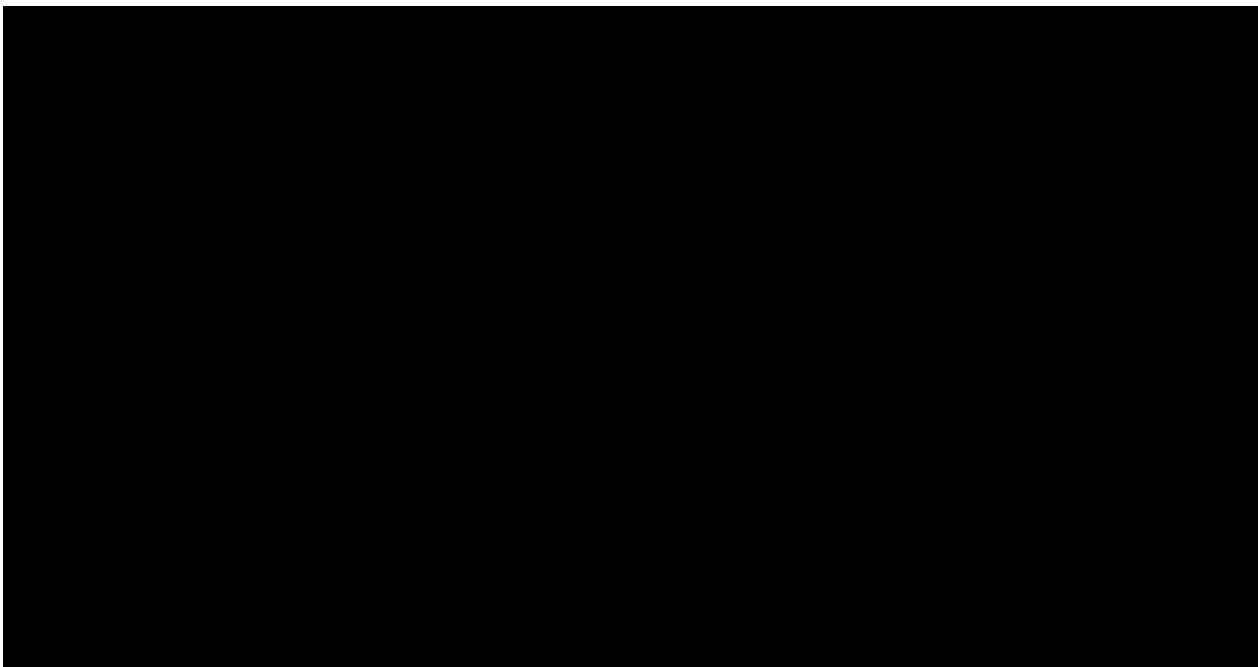
⁶ The system is packing when available pipeline flowing supplies plus storage withdrawal exceeds the real-time send out. The system is drafting when the real-time sendout exceeds available pipeline flowing supplies plus storage withdrawal. When allowed to appropriately prepare for the peak sendout periods, the SoCalGas system typically has approximately ■■■■■ in available draft supplies that can be used to meet the real-time sendout. For example, if the system is drafting approximately ■■■■■ and the system has ■■■■■ 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)
03/11	100	25		8	95	203	78	
03/11	103	24		5	102	162	35	

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.

Gas Day	Aliso Canyon Withdrawal (BCF)	Non-Aliso Canyon Withdrawal (BCF)
03/11	0.314	



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.

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 March, month-end minimum inventory requirements, as stated in the 2018-19 Winter Technical Assessment. The table below also provides the total withdrawal of each storage field on Gas Day March 11. It should be noted that there were still 20 days remaining in the month of March after this event and it is not unusual to experience winter conditions throughout the entire month of March.

Storage Field	March 2019 Month-End Minimum (BCF)	Approximate Inventory Remaining at End of Withdrawal, Mar 12 (BCF)	Withdrawal from Gas Day Mar 11 (BCF)	Inventory Remaining Minus Month-End Minimum (BCF)
Aliso Canyon	2.1	19.519	0.314	17.419
Honor Rancho	5.0			
La Goleta	7.5			
Playa Del Rey	0.7			

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

SoCalGas proactively worked with the Balancing Authorities 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 March 11, 2019 and the same time last year, there was significantly 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 planned to

withdraw gas from Aliso Canyon consistent with the Aliso Canyon Withdrawal Protocol. Preserving these storage inventories at the non-Aliso Canyon storage fields was 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. Assuming a constant daily withdrawal rate throughout March from each storage field (using March 1 inventory levels), Aliso Canyon, Honor Rancho, La Goleta, and Playa Del Rey would have had daily target withdrawal limits, when possible, of ■ MMCFD, ■ MMCFD, ■ MMCFD, and ■ MMCFD, respectively, in order to not fall below their respective, month-end minimum inventory levels.

- 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. On April 2, 2019, SoCalGas submitted its Summer 2019 Technical Assessment which focused 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. Given SoCalGas' extensive inventory management efforts and the fortunate timing of warmer weather occurring in mid-March, the non-Aliso Canyon storage fields stayed above their March month-end minimum levels. As of approximately March 15, which marked the start of net injection gas days, Honor Rancho, La Goleta and Playa Del Rey were over their minimum levels by approximately 1,300 MMCF, 800 MMCF and 100 MMCF, respectively.
- 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.