February 10, 2019

The California Public Utilities Commission, Energy Division was notified by Southern California Gas Company of Aliso Canyon withdrawals at approximately 11:22 PM on February 10, 2019. This posting will be updated with a report containing more information as soon as possible.

February 27, 2019 update

The California Public Utilities Commission, Energy Division was notified by Southern California Gas Company that withdrawals from Aliso Canyon ceased at approximately 2:58 PM on February 24, 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 22, 2019 update

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

System-Wide Voluntary Curtailment Extended for Electric Generation

Due to ongoing cold weather conditions and high customer demand for natural gas, the system-wide voluntary curtailment of electric generation demand has been extended until 11:59 PM PCT, February 18, 2019.

SoCalGas has issued the system-wide voluntary curtailment order of electric generation demand in accordance with the Aliso Canyon Withdrawal Protocol. The curtailment is a voluntary request coordinated through the Balancing Authorities (CAISO and LADWP) for them to limit and/or reduce electric generation demand on our system, to the extent it does not impact electric system integrity. All SoCalGas storage fields, including Aliso Canyon, are being used to provide system reliability.

In addition, with the current forecasted weather, SoCalGas is asking customers to conserve natural gas where possible.

All noncore customers should continue to monitor ENVOY® at www.socalgasenvoy.com/ for further updates.

Please contact your Account Representative or the Gas Scheduling Helpline if you have any questions.

SoCalGas
A Sempra Energy utility®

System-Wide Curtailment Watch

Due to the ongoing cold weather conditions and high customer demand for natural gas, in addition to the system-wide voluntary curtailment of electric generation demand that is currently in effect, SoCalGas has issued a system-wide Curtailment Watch for the SoCalGas and SDG&E service territories. The curtailment watch is effective starting 12:00 PM February 19, 2019 and until further notice. Customers may be required to reduce their natural gas use if a curtailment is issued.

All noncore customers should continue to monitor ENVOY® at www.socalgasenvoy.com/ for further updates.

Please contact your Account Representative or the Gas Scheduling Helpline if you have any questions.

SoCalGas Electric Generation Curtailment

Due to forecasted low temperatures and expected high customer demand, SoCalGas is issuing a curtailment for electric generation customers on the SoCalGas and SDG&E system, in accordance with Rule 23, effective 12:00 AM PCT, February 20, 2019. During this curtailment, electric generation customers will be curtailed based on current day-ahead demand forecasts and weather conditions in coordination with the Balancing Authorities. This curtailment will continue until further notice.

System conditions remain dynamic and are subject to change. Until further notice, a system-wide curtailment watch for both SoCalGas and SDG&E will remain in effect for all other noncore customers. Customers are advised that they may be receiving a notice to curtail service.

Customers should continue to monitor ENVOY at http://www.socalgasenvoy.com for further updates.

Please contact your Account Manager if you have any questions.

SoCalGas Electric Generation Curtailment Update

The curtailment, in accordance with Rule 23, for electric generation customers on the SoCalGas system will end at 11:59 PM PCT, February 21, 2019. Also, the system-wide Curtailment Watch for SoCalGas and SDG&E that was issued on February 19, 2019, will end effective 11:59 PM PCT on February 21, 2019.

Due to continued low temperatures and expected high customer demand, effective 12:00 AM PCT, February 22, 2019 through 11:59 PM February 25, 2019, SoCalGas has issued a system-wide voluntary curtailment for electric generation customers. SoCalGas has issued the system-wide voluntary curtailment order of electric generation demand in accordance with the Aliso Canyon Withdrawal Protocol. The curtailment is a voluntary request coordinated through the Balancing Authorities (CAISO and LADWP) for them to limit and/or reduce electric generation demand on SoCalGas' system, to the extent it does not impact electric system integrity. All SoCalGas storage fields, including Aliso Canyon, are being used to provide system reliability. SoCalGas will post the withdrawal volumes for Aliso Canyon on ENVOY following the conclusion of the withdrawal event.

Customers should continue to monitor ENVOY at https://scgenvoy.sempra.com for further updates.

Please contact your Account Manager if you have any questions.

SoCalGas has declared a Low Operational Flow Order (Low OFO) Stage 4, -5% on Cycle 2, Evening for Wednesday, 02/20/2019

Customers must ensure that they meet the deliverability requirements as set by the stage and tolerance of this Low OFO event.

For more information please reference SoCalGas Rules and Tariffs.

If you have any questions, please call the Gas Scheduling HelpLine at (213) 244-3900 or contact them via e-mail at GasScheduling@Semprautilities.com.

SoCalGas has declared a Low Operational Flow Order (Low OFO) Stage 4, -5%
on Cycle 2, Evening for Thursday, 02/21/2019

Customers must ensure that they meet the deliverability requirements as set by the stage and tolerance of this Low OFO event.

For more information please reference SoCalGas Rules and Tariffs.

If you have any questions, please call the Gas Scheduling HelpLine at (213) 244-3900 or contact them via e-mail at GasScheduling@Semprautilities.com.

Aliso Canyon Withdrawal Volumes

In order to support system reliability, SoCalGas executed withdrawals of gas from Aliso Canyon at approximately 11:22 PM PCT on February 10, 2019. Withdrawal operations ceased at approximately 2:58 PM PCT on February 24, 2019. The withdrawal volumes for each Gas Day are:

- 2/10/2019: 0.179 Bcf
- 2/11/2019: 0.646 Bcf
- 2/12/2019: 0.492 Bcf
- 2/13/2019: 0.625 Bcf
- 2/14/2019: 0.228 Bcf
- 2/15/2019: 0.254 Bcf
- 2/16/2019: 0.169 Bcf
- 2/17/2019: 0.541 Bcf
- 2/18/2019: 0.766 Bcf
- 2/19/2019: 0.659 Bcf
- 2/20/2019: 0.583 Bcf
- 2/21/2019: 0.722 Bcf
- 2/22/2019: 0.535 Bcf
- 2/23/2019: 0.345 Bcf
- 2/24/2019: 0.108 Bcf

Note that a Gas Day is from 7 AM to 7 AM.

The system-wide voluntary curtailment of electric generation customers will end 11:59 PM PCT, February 25, 2019.

SOUTHERN CALIFORNIA GAS COMPANY

ALISO CANYON WITHDRAWAL PROTOCOL (11-2-17)

SOCALGAS RESPONSE TO CPUC-ENERGY DIVISION
DATED FEBRUARY 25, 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 11:22 pm on February 10, 2019 and ceased at approximately 2:58 pm on February 24, 2019.

a. The total withdrawal from the field was 6.84 Bcf. The hourly withdrawals from the field are provided in the attached spreadsheet. 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.

   REDACTED

b. 54 wells were used for making withdrawals. Please see the attached spreadsheet.

   REDACTED

c. The pre- and post-withdrawal Aliso working gas inventory were 27.26 Bcf and 20.42 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.

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. Please see Response 1.f.

h. No.

SOUTHERN CALIFORNIA GAS COMPANY
30-Day Aliso Canyon Withdrawal Report
Response Dated March 22, 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 4, 2019 and February 24, 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

Curtailment 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 Envoy Critical Notices posted during this cold event.

<table>
<tr><th>Notice Date</th><th>Summary of Notice (Times stated are Pacific Time)</th></tr>
<tr><td>02/02/2019</td><td>Issued system-wide voluntary curtailment of electric generation effective from February 2 at 2:00 PM through February 7 at 7:00 AM.</td></tr>
<tr><td>02/05/2019</td><td>Issued system-wide curtailment watch effective from February 6, 2019 at 12:00 AM until further notice.</td></tr>
<tr><td>02/05/2019</td><td>Notified customers that the 1,317 MMCFD of Aliso Canyon withdrawal capacity stated in the Winter 2018-2019 Technical Assessment is reduced due to lower inventory levels and further reduced by approximately 420 MMCFD due to unplanned repairs.</td></tr>
<tr><td>02/05/2019</td><td>Issued a curtailment of electric generation, in accordance with Rule 23, effective from February 6, 2019 at 12:00 AM until further notice.</td></tr>
<tr><td>02/07/2019</td><td>Notified customers that a temporary repair at Aliso Canyon restored 200 MMCFD of its withdrawal capacity.</td></tr>
<tr><td>02/08/2019</td><td>Notified customers that the system-wide curtailment watch and the Rule 23 curtailment of electric generation would end on February 8, 2019 at 11:59 PM. Issued a system-wide voluntary curtailment of electric generation effective February 9, 2019 at 12:00 AM through February 12, 2019 at 11:59 PM.</td></tr>
<tr><td>02/10/2019</td><td>Notified customers of the times of initiation and cessation of withdrawal from Aliso Canyon – Gas Day[2] February 4, 2019 at approximately 6:30 PM through Gas Day February 9, 2019 at approximately 11:37 PM – as well as Aliso Canyon’s approximate withdrawal volumes for each Gas Day in that period.
<table>
<tr><th>Gas Day</th><th>Aliso Canyon Withdrawal Volume (BCF)</th></tr>
<tr><td>02/04/2019</td><td>0.185</td></tr>
<tr><td>02/05/2019</td><td>0.654</td></tr>
<tr><td>02/06/2019</td><td>0.772</td></tr>
<tr><td>02/07/2019</td><td>0.672</td></tr>
<tr><td>02/08/2019</td><td>0.624</td></tr>
<tr><td>02/09/2019</td><td>0.255</td></tr>
</table>
</td></tr>
<tr><td>02/11/2019</td><td>Advised customers and shippers to pay close attention to Envoy and schedule their volumes accordingly due to inclement weather throughout the service territories.</td></tr>
<tr><td>02/12/2019</td><td>Notified customers that the system-wide voluntary curtailment of electric generation that was effective beginning on February 9, 2019 was being extended until February 18, 2019 at 11:59 PM.</td></tr>
</table>

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

<table>
<tr><td>02/17/2019</td><td>Notified customers that the system-wide voluntary curtailment of electric generation that was effective beginning on February 9, 2019 was being extended until February 22, 2019 at 11:59 PM.</td></tr>
<tr><td>02/19/2019</td><td>Issued a system-wide curtailment watch effective from February 19, 2019 at 12:00 PM until further notice.</td></tr>
<tr><td>02/19/2019</td><td>Issued a curtailment of electric generation, in accordance with Rule 23, effective from February 20, 2019 at 12:00 AM until further notice.</td></tr>
<tr><td>02/21/2019</td><td>Notified customers that the curtailment of electric generation, in accordance with Rule 23, that was effective on February 20, 2019 and the system-wide curtailment watch that was effective on February 19, 2019 would end on February 21, 2019 at 11:59 PM. Issued a system-wide voluntary curtailment of electric generation effective from February 22, 2019 at 12:00 AM through February 25, 2019 at 11:59 PM.</td></tr>
<tr><td>02/25/2019</td><td>Notified customers that the system-wide voluntary curtailment of electric generation would end on February 25, 2019 at 11:59 PM. Notified customers of the times of initiation and cessation of withdrawal from Aliso Canyon – Gas Day February 10, 2019 at approximately 11:22 PM through Gas Day February 24, 2019 at approximately 2:58 PM – as well as Aliso Canyon’s withdrawal volumes for each Gas Day in that period.

<table>
<tr><th>Gas Day</th><th>Aliso Canyon Withdrawal Volume (BCF)</th></tr>
<tr><td>02/10/2019</td><td>0.179</td></tr>
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<tr><td>02/18/2019</td><td>0.766</td></tr>
<tr><td>02/19/2019</td><td>0.659</td></tr>
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<tr><td>02/23/2019</td><td>0.345</td></tr>
<tr><td>02/24/2019</td><td>0.108</td></tr>
</table>
</td></tr>
</table>

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 cold event.

Low OFO Declarations for each Gas Day		
February 4	Stage 3	-5%
February 5	Stage 3	-5%
February 6	Stage 3	-5%
February 7	Stage 4	-5%
February 8	Stage 4	-5%
February 9	Stage 3	-5%
February 10	Stage 3	-5%
February 11	Stage 3	-5%
February 12	Stage 3	-5%
February 13	Stage 3	-5%
February 14	Stage 3	-5%
February 15	Stage 3	-5%
February 17	Stage 3	-5%
February 18	Stage 3	-5%
February 19	Stage 3	-5%
February 20	Stage 4	-5%
February 21	Stage 4	-5%
February 22	Stage 3	-5%
February 23	Stage 3	-5%

Restricted Maintenance Operations

Gas Control declared restricted maintenance operations for these periods: 1) from February 3, 2019 at 7:00 AM Pacific Time through February 9, 2019 at 7:00 AM Pacific Time and 2) from February 11, 2019 at 7:00 AM Pacific Time through February 22, 2019 at 12:00 PM Pacific Time.

Gas Control declared restricted maintenance operations at transmission pipeline compressor stations, transmission pipelines, and storage facilities, noting anticipated high customer demand due to forecasted low temperatures. 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.

Demand Response

The table below lists the dates and times when SoCalGas initiated Smart Therm Demand Response during this cold event.

Date	Time (Pacific Time)
02/04/2019	5AM – 9AM
02/05/2019	5AM – 9AM
02/06/2019	5AM – 9AM
02/07/2019	5AM – 9AM
02/08/2019	5AM – 9AM
02/11/2019	5AM – 9AM
02/11/2019	6PM – 10PM
02/12/2019	5AM – 9AM
02/12/2019	6PM – 10PM
02/13/2019	5AM – 9AM
02/13/2019	6PM – 10PM
02/14/2019	5AM – 9AM
02/14/2019	6PM – 10PM
02/15/2019	5AM – 9AM
02/15/2019	6PM – 10PM
02/19/2019	5AM – 9AM
02/20/2019	5AM – 9AM
02/21/2019	5AM – 9AM
02/22/2019	5AM – 9AM

Customers participating in the Demand Response program received a notice at least nine hours before the events occurred except for some customers with Honeywell thermostats who were notified two hours before. During the demand response events, thermostats were lowered up to four degrees from their current setpoint. Once the Demand Response event ended, thermostats were returned to their original setpoints.

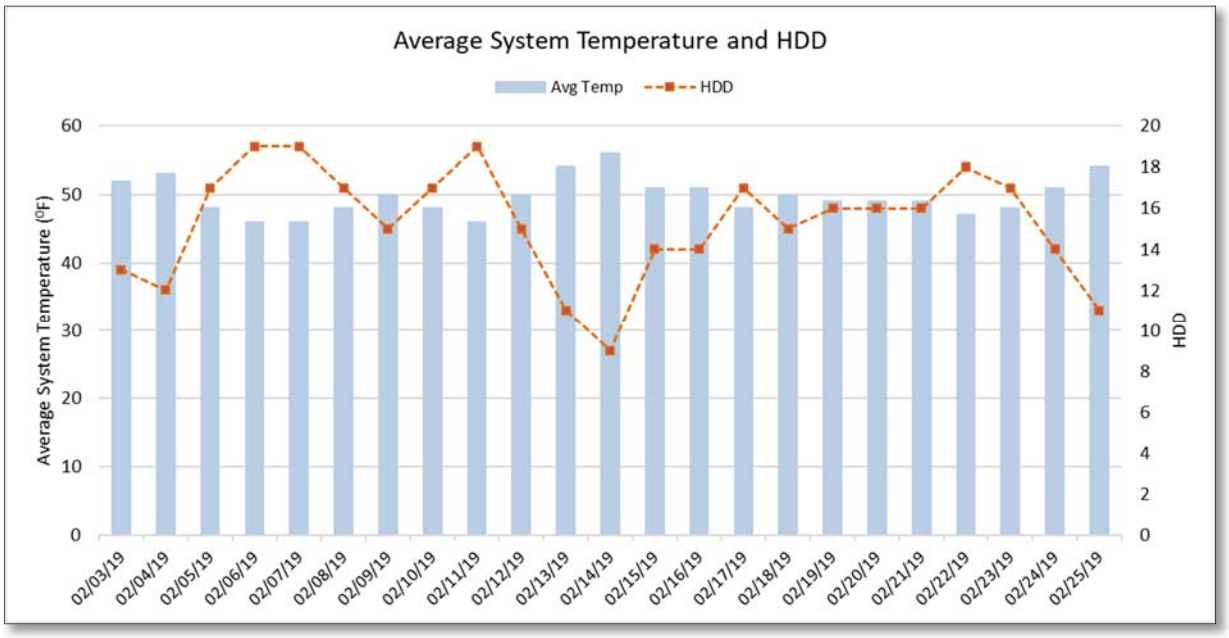
Dial-It-Down

SoCalGas issued a Dial It Down Alert effective from February 2, 2019 through February 25, 2019. Southern Californians were urged to reduce their natural gas use.

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

Weather

The graph below shows the system average heating degree days[3] ("HDD") and the daily custom system average temperatures[4] for the SoCalGas and SDG&E service territories, from February 3, 2019 through February 25, 2019. *The Los Angeles Times* reported that February 2019 was the coldest February in Los Angeles history since 1962 when it last snowed in Downtown Los Angeles.[5] The average high for the month was 61 degrees which makes it the eighth-coldest February on record for Downtown Los Angeles.[6] The month had one of the longest stretches of consecutive days with high temperatures below 70 degrees in Downtown Los Angeles.[7]



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. This is especially true for the 2018-19 winter season which has resulted in lower inventory levels at the non-Aliso Canyon fields and in turn led to reduced available withdrawal capacities.

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[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.

[5] February is coldest in Los Angeles in nearly 60 years; *Los Angeles Times*; February 25, 2019; http://www.latimes.com/local/lanow/la-me-ln-cold-february-20190225-story.html.

[6] A February to remembrrr in L.A.: It never even reached 70 degrees; *Los Angeles Times*; February 28, 2019; http://www.latimes.com/local/lanow/la-me-ln-cold-february-20190228-story.html

[7] One of the Longest Stretches of Consecutive Days with High Temperatures Below 70 Degrees and 80 Degrees in Downtown Los Angeles; *National Weather Service Public Information Statement*; March 6, 2019; https://www.wrh.noaa.gov/total_forecast/getprod.php?wfo=lox&pil=PNS&sid=LOX

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. These conditions resulted in decreased storage withdrawal capabilities to respond to this cold event.

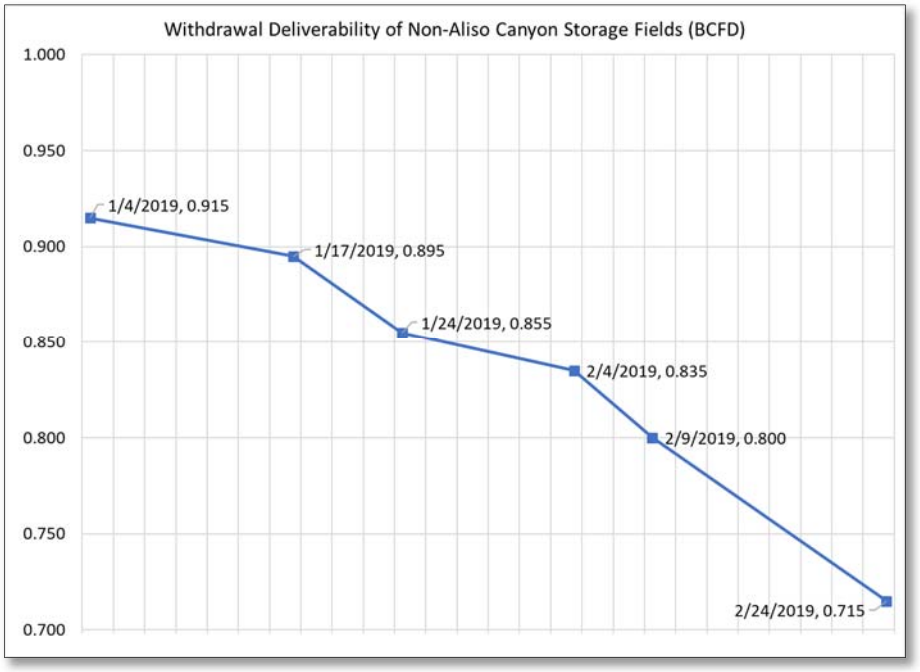
The table below provides the approximate inventories and withdrawal capacities of each of the storage fields at the beginning and end of the cold weather event. As can be seen below, the aggregate withdrawal capacity of the non-Aliso Canyon fields decreased by approximately 14% during this cold weather period.

Storage Field	**Gas Day Feb 4, 2019 Inventory (BCF)**	**Gas Day Feb 4, 2019 Withdrawal Capacity (MMCFD)**	**Gas Day Feb 24, 2019 Inventory (BCF)**	**Gas Day Feb 24, 2019 Withdrawal Capacity (MMCFD)**
Aliso Canyon	30.416	[8]	20.418	
Honor Rancho				
La Goleta				
Playa Del Rey				
Total Storage W/O Aliso		835	19.881	715
Total Storage W/ Aliso				

[8] Envoy Critical Notice posted on 2/05/2019; temporarily reduced Aliso Canyon's withdrawal capacity due to a repair that was needed on the pipeline leading to Dehydration Unit 1.

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 during the cold event. The higher percentage in capacity utilization is likely due to the capacity constraints and the number of Stage 3 and Stage 4 Low OFOs declared.

Gas Day February 4, 2019 – Gas Day February 24, 2019			
	Average Available Pipeline Flowing Supply Capacity (MMCFD)	**Average Scheduled Pipeline Flowing Supply Quantity (MMCFD)**	**Average Percent Capacity Utilization**
Total System	2,808	2,636	93.9%

Total System Receipts vs. Total System Demand

The table below shows the total system receipts and demand during this cold event. With the non-Aliso Canyon fields having a withdrawal capacity of 835 MMCFD at the start of the cold weather event to 715 MMCFD at the end of the event, the volume of gas that needed to be supplied by these fields met or exceeded their aggregate withdrawal capacity on most days, with the average withdrawal needed over this cold weather event being approximately 791 MMCFD. In addition to all four fields being used to respond to daily peak demands, Aliso Canyon withdrawals were used to support the system so that the non-Aliso Canyon inventory could be preserved and/or restored to support the system during the remainder of the month.

Gas Day	Total Receipts (MMCF)	System Demand (MMCF)	Volume of gas that must be supplied by storage withdrawal (MMCF).[9]	Aliso Canyon Withdrawal Capacity (MMCFD) [10]	Non-Aliso Canyon Withdrawal Capacity (MMCFD)
02/04	2,524	3,298	774		835
02/05	2,763	3,931	1,168		820
02/06	2,668	3,980	1,312		800
02/07	2,729	3,603	875		800
02/08	2,650	3,272	622		800
02/09	2,577	2,961	385		800
02/10	2,683	3,570	887		800
02/11	2,683	3,693	1,010		785
02/12	2,701	3,256	555		785
02/13	2,595	3,408	814		775
02/14	2,707	3,172	465		735
02/15	2,588	3,236	649		715
02/16	2,586	3,054	468		755
02/17	2,655	3,375	721		755
02/18	2,649	3,756	1,107		755
02/19	2,701	3,672	972		735
02/20	2,707	3,642	934		735
02/21	2,673	3,828	1,155		715
02/22	2,667	3,524	857		715
02/23	2,568	3,133	565		715
02/24	2,578	2,887	309		715

Available Supply vs. Hourly Demand

The table below compares the pipeline flowing supplies and available storage withdrawals to the peak demands for each morning and evening (first line and second line, respectively for each day) during this cold event. It should be noted that for most peak periods during this cold event, the peak demand still exceeded the sum of flowing supplies plus withdrawals available from all four storage fields. When the sum of pipeline flowing supplies and the available storage field

[9] 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.

[10] As mentioned in an earlier footnote, there was an Envoy Critical Notice posted on 02/05/2019 which temporarily reduced Aliso Canyon's withdrawal capacity due to a necessary repair. During the subsequent days, a temporary repair was completed and a bypass was installed that increased the withdrawal capacity; however, due to Aliso Canyon's significant inventory reduction during this repair time period, the withdrawal capacity ultimately decreased (unrelated to the reduction taken due to the repair).

withdrawal is exceeded by the peak demand, the system must use line pack (the system must draft) to make up the difference.[11]

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)*	Demand at Start of Ramp (MMCFH)	Morning and Evening Peak Demand (MMCFH)	Peak Demand minus [Flowing Supplies plus non-Aliso Canyon Withdrawal Capacity][12] (MMCFH)	Calculated Draft (Pack). Peak Demand minus [Flowing Supplies plus Aliso Cyn & Non-Aliso Cyn Withdrawal Capacity][13] (MMCFH)
02/04	98	36	[redacted]	6	88	168	34	[redacted]
02/04	102	35		5	123	182	45	
02/05	101	35		6	99	200	64	
02/05	113	34		6	133	216	69	
02/06	112	34		8	122	238	92	
02/06	107	33		6	110	221	81	
02/07	110	33		6	141	244	101	
02/07	105	33		7	99	176	38	
02/08	113	33		7	119	237	91	
02/08	105	33		7	98	161	23	
02/09	107	33		5	103	169	29	
02/09	104	33		4	101	136	(1)	
02/10	104	33		6	102	157	20	
02/10	111	33		7	131	171	27	
02/11	106	33		7	122	231	92	
02/11	109	33		4	108	192	50	
02/12	109	33		7	129	223	81	
02/12	110	33		5	99	188	45	
02/13	106	33		7	95	187	48	
02/13	104	32		5	141	189	53	
02/14	105	32		7	79	170	33	
02/14	111	31		7	123	158	16	
02/15	109	31		7	95	166	26	
02/15	105	31		4	116	163	27	
02/16	104	31		6	103	166	31	
02/16	107	31		5	106	152	14	
02/17	102	31		6	102	158	25	
02/17	110	31		4	123	170	29	
02/18	106	31		7	109	190	53	
02/18	107	31		5	118	192	54	
02/19	104	31		5	132	235	100	
02/19	108	31		4	116	186	47	
02/20	112	31		7	110	210	67	
02/20	109	31		7	138	183	43	
02/21	109	31		5	110	207	67	

[11] 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.

[12] Next to last column explanation: If the calculated number is negative, that means the peak demand could be met with flowing supplies plus withdrawals from non-Aliso Canyon storage fields.

[13] Last column explanation: If the calculated number is negative, that means the peak demand could be met with flowing supplies plus withdrawals from all four storage fields.

02/21	108	30	[redacted]	5	129	205	67	[redacted]
02/22	107	30		6	130	225	88	
02/22	105	30		6	108	166	31	
02/23	108	30		7	128	200	62	
02/23	105	30		4	96	134	(1)	
02/24	101	30		6	110	171	40	
02/24	106	30		7	84	130	(6)	
*Ramping period is the duration of time from "start of ramp" to "peak demand"								

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 cold weather event. By using the Aliso Canyon withdrawals strategically throughout this cold weather event and the remainder of the month, Honor Rancho and Playa Del Rey storage fields were able to come in at slightly above their February month-end minimum storage inventory levels.[14]

Gas Day	Aliso Canyon Withdrawal (BCF)	Non-Aliso Canyon Withdrawal (BCF)
02/04	0.185	[redacted]
02/05	0.654	
02/06	0.772	
02/07	0.672	
02/08	0.624	
02/09	0.255	
02/10	0.179	
02/11	0.646	
02/12	0.492	
02/13	0.625	
02/14	0.228	
02/15	0.254	
02/16	0.169	
02/17	0.541	
02/18	0.766	
02/19	0.659	
02/20	0.583	
02/21	0.722	
02/22	0.535	
02/23	0.345	
02/24	0.108	

[14] 2018-19 Winter Technical Assessment contains month-end minimum inventory levels for each field that were calculated to support core reliability.

Storage Fields' Remaining Inventories

The table below compares the remaining inventories for each storage field at the end of the withdrawal period (with four days remaining for the month of February) to their respective February 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 from Gas Day February 4 through Gas Day February 24.

Storage Field	**February 2019 Month-End Minimum (BCF)**	**Inventory Remaining on Feb 24 (BCF)**	**Withdrawal from Feb 4 through Feb 24 (BCF)**	**Inventory Remaining Minus Month-End Minimum (BCF)**
Aliso Canyon	3.8	20.418	10.015	16.618
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 each day during the cold weather event to reduce the level on the on-system generation demand 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. However, it should be noted that there were several days during this cold weather event where SoCalGas' Rule No. 23 was utilized as the forecast predicted that withdrawals from all four storage fields would not be able to meet the system demand.

Observations and Recommendations

The cold weather 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. Midway through this February cold weather event, 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, especially when an event runs multiple consecutive days. 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 their near maximum inventory levels, to provide reliability for customers in the 2019-2020 Winter season.

- As previously mentioned above, there was coordination between the Balancing Authorities and SoCalGas during the cold weather event. However, this coordination was not likely to eliminate the need for Aliso Canyon withdrawals on most days during this particular period because the Balancing Authorities' already low demand as compared to the system's core demand and their related inability to reduce load sufficient enough to mitigate withdrawal from Aliso Canyon without risking electric grid reliability.

- The high demand placed on the system during this cold weather event further supports eliminating or modifying the Withdrawal Protocol to allow Aliso Canyon to increase system flexibility and reliability and add to available supplies more strategically.