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SoCalGas Winter 2021-2022 Technical Assessment

Additional submitted attachment is included below.

SOUTHERN CALIFORNIA GAS COMPANY WINTER 2021-22 TECHNICAL ASSESSMENT

October 21, 2021

Executive Summary

This technical assessment provides a forecasted outlook of system reliability during the coming winter season (November 1, 2021 through March 31, 2022) and analyzes the associated risks to energy reliability during this period. For this assessment, Southern California Gas Company (SoCalGas) has analyzed the following: (1) pipeline capacity available to bring gas into the system, (2) available storage withdrawal capacity and inventory levels needed for core reliability, (3) the forecasted winter demand, (4) available system capacity given the assumed winter supply and forecasted demand, and (5) the forecasted winter storage inventory. In performing this analysis, this assessment takes into consideration the various existing outages and operating restrictions on gas transmission and storage assets.

SoCalGas forecasts a demand of 4.97 billion cubic feet per day (BCFD) under the 1-in-10 year cold day design standard mandated by the California Public Utilities Commission (Commission), in which service is provided to both core and noncore customers, and a demand of 3.44 BCFD under the Commission-mandated 1-in-35 year peak day design standard, in which all noncore customers are assumed to be fully curtailed.[1]

Even with the use of the Aliso Canyon storage field, SoCalGas has insufficient capacity to meet the 1-in-10 year cold day design standard given the expected withdrawal capacity of all active storage fields at the minimum levels required for core reliability[2] and the assumed transmission pipeline capacity available during the peak demand months (December and January). As a result, SoCalGas has calculated an approximate maximum system-wide daily capacity available to serve end-use customers, based on existing and potential storage and pipeline capacities, of 3.91 to 4.25 BCFD with the support of Aliso Canyon. This capacity is sufficient to serve the 1-in-35 peak day design standard and still provide some level of service to noncore customers, provided sufficient supplies are delivered to the SoCalGas system. Without Aliso Canyon, this capacity is reduced to approximately 3.20 to 3.54 BCFD. Consistent with the Commission's Aliso Canyon Withdrawal Protocol dated July 23, 2019,[3] SoCalGas may use Aliso Canyon to maintain service to core and critical noncore customers.[4]

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[1] 2020 California Gas Report (CGR), pages 139-140.

[2] SoCalGas' storage fields will likely not be at maximum inventory levels during the peak winter demand months of December and January, and therefore maximum withdrawal rates would be unavailable.

[3] The Aliso Canyon Withdrawal Protocol dated July 23, 2019 was revised on April 1, 2020 to add two additional reporting requirements. These changes did not alter the conditions under which SoCalGas may withdraw gas from Aliso Canyon.

[4] This technical assessment examines capacities to serve the 1-in-35 year peak day, during which service to core customers may be at risk if storage inventories are depleted, and includes the preemptive use of Aliso Canyon to

Customer demand is not constant over the course of the day, and gas supplies from interstate pipelines travel slowly across the pipeline network at a steady rate. During those times of the day when demand exceeds the pipeline supply, SoCalGas must use supplies from its storage fields to make up the difference. When customer demand is reduced, SoCalGas will reduce the amount of supply taken from its storage fields or inject excess supply into storage to balance supply and demand and avoid overpressuring the system. Because storage supplies are not used at a constant rate for the entire day, the system capacity is often less than the sum of the available pipeline and storage supplies.

SoCalGas has also performed an analysis of projected system-wide storage inventory levels of all fields, including Aliso Canyon, through the winter season. Using demand forecast data prepared for the 2020 CGR, the projected SoCalGas capacity to receive pipeline supplies, and an estimate of storage field inventory levels on November 1, 2021, SoCalGas finds that noncore curtailment during the winter season may be required under cold temperature conditions. SoCalGas may need to curtail up to 23.5 billion cubic feet (BCF) of forecasted noncore demand to maintain minimum inventory levels needed for core reliability. SoCalGas' analysis indicates that, under these circumstances and without such noncore curtailments, SoCalGas storage inventory levels would be fully depleted before the end of the winter season, putting core service at significant risk.

Supply to the Southern Zone may also be impacted by supply constraints on Line 2000 of the El Paso Natural Gas (EPNG) pipeline system. Potential reductions to the SoCalGas system supply from this constraint were considered in the analysis of the SoCalGas Winter Technical Assessment. Additionally, this upstream supply constraint may impact the delivery of adequate supply to the California border to meet the Southern Zone minimum flow requirements despite SoCalGas having available receipt capacity.

As always, unexpected outages on the transmission pipeline and storage system, such as those resulting from third-party damage and safety-related conditions, or impacts to maintaining these capacities due to potential employee availability or governmental orders in response to COVID-19, could still occur throughout the winter season and impact our capacity to serve demand as presented in this technical assessment.

avoid loss of service to core customers by maintaining specified withdrawal targets. The Aliso Canyon Withdrawal Protocol, dated July 23, 2019, permits withdrawals from Aliso Canyon when one of four conditions are met (including Condition 4 when there is an "imminent and identifiable risk of gas curtailments created by an emergency condition that would impact public health and safety or result in curtailments of electric load that could be mitigated by withdrawals from Aliso Canyon"). Furthermore, in response to a SoCalGas request for guidance on whether the Withdrawal Protocol restricted SoCalGas from "curtail[ing] to maintain withdrawal capacity targets," Energy Division responded that "SoCalGas should manage its system as a prudent operator." (see Email from Edward Randolph to Devin Zornizer, dated 12/21/2017). Consistent with this clarification, this winter SoCalGas plans to prudently manage the inventory levels across all the storage fields to maintain withdrawal capacity targets, which could include noncore curtailments and withdrawals from Aliso Canyon.

System Reliability Assessment of Winter Months

The Commission has mandated two design standards for the winter operating season: the 1-in-10 year cold day standard, in which service is to be maintained to core customers and noncore customers under a temperature condition expected to recur once in a ten-year period; and the 1-in-35 year peak day standard, in which service is to be maintained to core customers under a temperature condition expected to recur once in a thirty-five-year period and service to all noncore customers is curtailed.

In assessing reliability in the upcoming winter, SoCalGas has analyzed the supply outlook for the system and the winter demand forecasts. These are addressed in turn below.

Supply Outlook

Available Flowing Pipeline Supplies

The SoCalGas/San Diego Gas and Electric (SDG&E) gas transmission system has a current capability to receive up to 3.295 BCFD of flowing supply on a firm basis.[5] This means if customers deliver that much supply to the SoCalGas system, and there is sufficient customer demand, SoCalGas can redeliver that gas supply to customers.[6] Supplies delivered to the SoCalGas system, however, do not reach these available receipt levels for a variety of reasons, including that customers may choose to use SoCalGas' balancing service rather than deliver supplies, California production has declined over time, system demand frequently does not require maximum delivery of supply, or flowing supplies may not be available due to weather patterns or maintenance impacting the interstate pipelines upstream of the SoCalGas system, such as during a polar vortex event over the Midwest or an interstate pipeline outage such as the incident on EPNG Line 2000. Additionally, planned and unplanned pipeline outages can further reduce available receipt capacity.

SoCalGas has determined ranges of flowing pipeline capacity and supplies by analyzing “best” and “worst” case scenarios. For the available receipt point supplies under both cases, Line 235-2 and Line 4000 are all assumed in service at reduced pressures, resulting in a Northern Zone receipt capacity of 1,250 million cubic feet per day (MMcfd). Although Line 3000 East is assumed to be out of service under the “worst case” scenario and back in service after December under “best case” scenario, sufficient receipt capacity exists at North Needles and Kramer Junction such that the loss of Line 3000 has no impact to the Northern System capacity.

Under a “best case” scenario, sufficient supply is assumed available and delivered at both Blythe and Otay Mesa in order to fully utilize the Southern System receipt capacity of 1,210 MMcfd. The ability to receive supply at Otay Mesa beyond 400 MMcfd is dependent upon local demand in San Diego or displacing supplies that would otherwise be delivered at Ehrenberg. The pipeline conditions are expected to be constant throughout the winter season.

[5] Reflects the current level of local California production.
[6] Customer demand may also be required to be in a specific location, such as on the Southern System in order to receive the full receipt capacity of 1,210 MMcfd at Blythe and Otay Mesa.

Under a "worst case" scenario, however, supply at Otay Mesa is assumed to be unavailable as, historically, little to no supply has been delivered at Otay Mesa. Furthermore, deliveries at Blythe are assumed to be only 60% of the receipt capacity due to the outage of EPNG Line 2000 in Arizona starting August 2021. The EPNG Line 2000 pipeline failure has reduced the transport capacity of the EPNG Southern System and the level of supply delivered for all shippers. Under 1-in-10 conditions, this upstream supply constraint may result in insufficient supply to support Southern System customer demand, and may require some level of noncore curtailment, beginning with EG demand in accordance with the Commission-approved procedure specified in SoCalGas Rule No. 23 and SDG&E Gas Rule No. 14.

In addition to the operating restrictions discussed above, SoCalGas factors in that customers do not typically fully balance their supply with their demand even given SoCalGas' balancing rules. While a review of scheduled deliveries shows that customers have used on average 80% of interstate available receipt capacity, SoCalGas has adopted utilization factors of 85% and 90% for this assessment. These factors reflect SoCalGas' expectation of tighter balancing requirements through this winter season in response to the storage capabilities and supply outlook. SoCalGas has therefore adopted these assumptions in the capacity calculations in this report for all supplies except for local California production, which is assumed at the current production rate, and at the Blythe receipt point in the "worst case" scenario, which is assumed at 60% due to the EPNG outage.

SoCalGas' ability to maintain uninterrupted service also depends upon customers delivering sufficient supply to the SoCalGas system. SoCalGas expects that there may be times during the winter season when gas supply from the interstate pipelines is unavailable due to weather conditions elsewhere in the country or pipeline constraints upstream of SoCalGas' system, such that supplies delivered to the system may be less than assumed in this assessment. These situations are beyond the scope of this technical assessment, and additional customer curtailment may be necessary to maintain system integrity and service to core and critical noncore customers under such conditions.

While SoCalGas has factored in the known operating restrictions on its transmission pipelines, unexpected outages on the transmission system, such as those resulting from third-party damage and safety-related conditions, may still occur throughout the winter season, further reducing available receipt capacity beyond the levels projected in even the "worst case" scenario.

Based on the scenario information outlined above, the resulting "best" and "worst" case scenarios for receipt capacities are detailed below in Tables 1 and 2.

Table 1
"Best Case" Available Flowing Pipeline Supplies

Receipt Point	Capacity/Supply (MMcfd)	Details
North Needles	480	Capacity limited to 1,250 MMcfd due to the operating pressure of Line 235 and Line 4000. No receipt capacity from Topock while Line 3000 is out, assumed restored after December. Sufficient receipt capacity available at North Needles and Kramer Junction to maintain the 1,250 MMcfd zone receipt capacity.
Topock	350	
Kramer Junction	420	
Blythe	980	Reduced receipt capacity due to loss of pipeline on Southern System.
Otay Mesa	230	Otay Mesa has a firm receipt capacity of 400 MMcfd, but is limited by the total 1,210 MMcfd receipt capacity of the Southern System. 230 MMcfd represents the remaining capacity to receive firm supply. Historically, little supply has been delivered at Otay Mesa.
Wheeler Ridge/ Kern River Station	765	
California Production	70	Current level of local California production.
Total	3,295	
Assume 85% Pipeline Utilization	**2,811**	

Table 2
"Worst Case" Available Flowing Pipeline Supplies

Receipt Point	Capacity/Supply (MMcfd)	Details
North Needles	700	Capacity limited to 1,250 MMcfd due to the operating pressure of Line 235 and Line 4000. Line 3000 assumed out of service for entire winter season; sufficient receipt capacity available at North Needles and Kramer Junction to maintain the 1,250 MMcfd zone receipt capacity.
Topock	0	
Kramer Junction	550	
Blythe	588	Reduced receipt capacity due to loss of pipeline on Southern System; additional loss of supply assumed from EPNG Line 2000 outage.
Otay Mesa	0	Supplies assumed to be unavailable as, historically, little to no supply has been delivered at Otay Mesa.
Wheeler Ridge/ Kern River Station	765	
California Production	70	Current level of local California production.
Total	2,673	
Assume 90% Pipeline Utilization	**2,472**	

Available Storage Supplies

The forecasted inventories with associated withdrawal rates for SoCalGas' Aliso Canyon and Non-Aliso Canyon storage fields at the start of the winter season and at those levels necessary to provide core customer reliability are presented below in Table 3. Under all-weather scenarios, gas will be withdrawn from storage throughout the winter season. Therefore, SoCalGas does not expect to be at maximum inventory levels system-wide during the peak demand periods of December through January, resulting in withdrawal capability lower than the maximum rates shown below.

Table 3
Projected Storage Field Performance, Winter 2021-22, Typical Well Maintenance Activities

Storage Field	Maximum		Forecasted at November 1		Minimum Level for Peak Day Reliability *	
	Inventory (BCF)	Withdrawal Capacity (MMcfd)	Inventory (BCF)	Withdrawal Capacity (MMcfd)	Inventory (BCF)	Withdrawal Capacity (MMcfd)
Aliso Canyon	34	930	33.4	919	16.5	710
Non-Aliso Canyon	50.1	1,129	46.6	1,037	22.7	730
Total	**84.1**	**2,059**	**80**	**1,956**	**39.2**	**1,440**

* End of December

This data is based on wells currently or forecast to be in service during the winter operating season and assumes a typical level of well outages at each field for routine maintenance and mandated reassessment. SoCalGas assumes in its forecast that there will be no outages beyond those already identified at any of the storage fields that would impact their ability to provide the winter withdrawal capacity assumed for this assessment. SoCalGas' storage capacities are continually reassessed in light of performance and the safety-related work planned, in progress, or completed at our storage fields. To the extent that more aggressive well maintenance or reassessment is necessary such that the withdrawal capacities or field performance assumed herein are impacted during the winter season, the results and findings of this assessment may change.

Peak Winter Demand Forecast and System Capacity Calculation

System Capacity

Using the pipeline supply and withdrawal assumptions presented in Tables 1-3 earlier, SoCalGas has calculated the system capacity to serve demand. System capacities with and without the use of Aliso Canyon are shown in Table 4.

Table 4
Winter 2021-22 System Capacity

	System Capacity (MMcfd)	
	Without Aliso Canyon	**With Aliso Canyon**
Best Case	3,540	4,250
Worst Case	3,200	3,910

The capacities are calculated based on the withdrawal available at the minimum inventory levels necessary to maintain core reliability discussed later in this report. SoCalGas notes that if it has higher inventory levels at its storage fields, it would have higher withdrawal rates than shown in Table 3, and as a result, it may have sufficient capacity to serve a 1-in-10 year cold day demand provided sufficient pipeline supply is delivered to the system. However, there should be no expectation that higher withdrawal rates will be available.

Demand Outlook: 1-in-10 Year Cold Day Event

For the upcoming winter season, SoCalGas forecasts a 1-in-10 year cold day demand of 4.97 BCFD, broken down by customer class in Table 5 below:

Table 5
Customer Demand Forecast, 1-in-10 Year Cold Day Event

Customer Type	Winter Demand (MMcfd)
Core (including wholesale core)	3,235
Noncore, Non-Electric Generation	659
Noncore, Electric Generation (EG)	1,072
Total	4,967

As previously mentioned, the incident on EPNG Line 2000 may impact the ability to receive sufficient supply from Blythe. Given the supply available from interstate pipelines, local California production, and expected storage withdrawal (including the use of Aliso Canyon) at the minimum inventory levels, SoCalGas expects that it will have insufficient supplies to meet the 1-in-10-year cold day demand forecast.[7] Therefore, in a 1-in-10-year cold day scenario, some level of noncore curtailment may be required, beginning with EG demand in accordance with the Commission-approved procedure specified in SoCalGas Rule No. 23 and SDG&E Gas Rule No. 14.

Note that the system capacity of 3,200 MMcfd under the "worst case" supply scenario without the use of Aliso Canyon shown in Table 4 is less than the core customer demand under a 1-in-10 year cold day demand condition shown above in Table 5. This does not imply that SoCalGas believes that service to its core customers is at risk at any time during this winter season provided sufficient pipeline supply is

[7] This cold day event has the potential to occur in December or January, and may also occur more than once per season.

delivered to the system. Per the Aliso Canyon Withdrawal Protocol, SoCalGas would be permitted to use Aliso Canyon to maintain service to core customers and noncore customers.[8]

Again, SoCalGas may have sufficient capacity to serve a 1-in-10 year cold day demand if it has higher inventory levels at its storage fields, and as a result higher withdrawal rates than those shown in Table 3. As previously stated, there should be no expectation that higher withdrawal rates will be available.

Demand Outlook: 1-in-35 Year Peak Day Event

SoCalGas forecasts a 1-in-35 year peak day demand of 3,440 MMcfd, consisting entirely of core demand[9] per the design standard. With prudent and active management of storage inventory, including the use of Aliso Canyon to maintain inventory levels in the other storage fields needed for core reliability, SoCalGas expects to have sufficient supply and capacity to meet this design standard under a "best" and "worst" case pipeline supply scenarios. However, the 1-in-35 year peak day demand under a "worst" case pipeline supply scenario could not be supported without the use of supply from Aliso Canyon. As previously discussed, the Aliso Canyon Withdrawal Protocol would allow the use of Aliso Canyon in this situation and SoCalGas does not believe, therefore, that core service is at risk this winter season.

SoCalGas must maintain minimum levels of storage supply throughout the winter season to protect core reliability. Using inventory and withdrawal relationships for the storage fields, SoCalGas has determined the minimum inventory level required at each storage field to produce the needed withdrawal rates for core reliability. These minimum inventory levels are shown below in Table 6. SoCalGas will use supply from Aliso Canyon and our curtailment procedures (as necessary) to preserve these minimum inventory levels at all four storage fields throughout the winter season, in accordance with the Aliso Canyon Withdrawal Protocol, SoCalGas Rule No. 23, and SDG&E Gas Rule No. 14.

Table 6
Month-End Minimum Inventory Requirements for Core Reliability

Storage Field	Month-End Minimum Inventory (BCF)				
	NOV 2021	DEC 2021	JAN 2022	FEB 2022	MAR 2022
Aliso Canyon	17.1	16.5	12.9	8.5	2.1
Honor Rancho	13.9	13.2	12.6	7.5	5.0
La Goleta	8.0	7.9	7.7	7.6	7.5
Playa del Rey	1.6	1.6	1.5	1.1	0.7
TOTAL	**40.6**	**39.2**	**34.7**	**24.7**	**15.3**

The Ventura compressor station is necessary to fill the Goleta storage field, and because of the capacity at the station, if SoCalGas were to draw La Goleta inventory down to near zero inventory, it is expected that the field could not be refilled in the summer 2022 operating season to sufficient levels needed to

[8] Aliso Canyon Withdrawal Protocol, Condition #4: "There is an imminent and identifiable risk of gas curtailments created by an emergency condition that would impact public health and safety or result in curtailments of electric load that could be mitigated by withdrawals from Aliso Canyon."
[9] Retail and wholesale.

support winter 2022-23 demand. SoCalGas will therefore manage its system to maintain 7.5 BCF at La Goleta through March 2022 and has included that additional inventory in Table 6 above.

Seasonal Reliability Assessment

Using demand forecast data prepared for the 2020 CGR for the winter season (November 2021 through March 2022, cold, average, and hot temperature conditions with base hydro) and a projection of expected storage inventory levels on November 1 (80 BCF), SoCalGas has performed a mass balance examining the impact on its storage supplies, including supply stored in Aliso Canyon, and our ability to meet customer demand under both the "best" and "worst" case pipeline capacity scenarios. These mass balances presented below in Tables 7 and 8, are simply a comparison of forecasted demand against assumed supply and do not account for actual withdrawal capability.

Table 7
Monthly Storage Assessment, "Best" Case Supply Assumption, 85% Utilization (MMCF)

	NOV 2021	DEC 2021	JAN 2022	FEB 2022	MAR 2022	Curtailment Total
Pipeline Supply	84,338	87,149	87,149	78,715	87,149	
COLD TEMPERATURE CONDITION						
CGR Monthly Demand	82,530	105,772	99,169	87,948	78,864	
Storage WD	-1,808	18,623	12,020	9,233	-8,285	
Mth-end Inv	81,808	63,185	51,165	41,932	50,217	
Min Inv Req	40,600	39,200	34,700	24,700	15,300	
Curtailment	0	0	0	0	0	**0**
AVERAGE TEMPERATURE CONDITION						
CGR Monthly Demand	77,910	97,898	91,636	82,124	74,307	
Storage WD	-6,428	10,749	4,487	3,409	-12,842	
Mth-end Inv	84,100	73,351	68,864	65,455	78,297	
Min Inv Req	40,600	39,200	34,700	24,700	15,300	
Curtailment	0	0	0	0	0	**0**
HOT TEMPERATURE CONDITION						
CGR Monthly Demand	74,940	91,667	85,746	77,056	70,587	
Storage WD	-9,398	4,518	-1,403	-1,659	-16,562	
Mth-end Inv	84,100	79,582	80,985	82,644	84,100	
Min Inv Req	40,600	39,200	34,700	24,700	15,300	
Curtailment	0	0	0	0	0	**0**

Table 8
Monthly Storage Assessment, "Worst" Case Supply Assumption, 90% Utilization (MMCF)

	NOV 2021	DEC 2021	JAN 2022	FEB 2022	MAR 2022	Curtailment Total
Pipeline Supply	74,145	76,617	76,617	69,202	76,617	
COLD TEMPERATURE CONDITION						
CGR Monthly Demand	82,530	105,772	99,169	87,948	78,864	
Storage WD	8,385	29,155	22,552	18,746	2,247	
Mth-end Inv	71,615	42,460	19,908	15,954	22,453	
Min Inv Req	40,600	39,200	34,700	24,700	15,300	
Curtailment	0	0	14,792	8,746	0	**23,538**
AVERAGE TEMPERATURE CONDITION						
CGR Monthly Demand	77,910	97,898	91,636	82,124	74,307	
Storage WD	3,765	21,281	15,019	12,922	-2,310	
Mth-end Inv	76,235	54,954	39,935	27,013	29,323	
Min Inv Req	40,600	39,200	34,700	24,700	15,300	
Curtailment	0	0	0	0	0	**0**
HOT TEMPERATURE CONDITION						
CGR Monthly Demand	74,940	91,667	85,746	77,056	70,587	
Storage WD	795	15,050	9,129	7,854	-6,030	
Mth-end Inv	79,205	64,155	55,026	47,172	53,202	
Min Inv Req	40,600	39,200	34,700	24,700	15,300	
Curtailment	0	0	0	0	0	**0**

The mass balance assessment for the "best" case supply scenario (Table 7) shows that on a monthly basis under all temperature conditions, SoCalGas has sufficient pipeline receipt capacity and storage inventory supplies to serve all noncore customer demand without curtailment up to the system capacity, without impacting core reliability requirements.

For the "worst" case supply scenario (Table 8), SoCalGas will have sufficient pipeline receipt capacity and storage inventory supplies to serve all noncore customer demand under most temperature conditions except for cold temperature while maintaining minimum inventory requirements. Under a "worst" case supply scenario, SoCalGas may need to curtail up to 23.5 BCF of noncore customer demand over the winter season with cold temperatures.

These mass balance calculations assume that gas supplies are delivered to the SoCalGas system equal to the assumed pipeline capacities, including utilization assumptions. In this sense, the mass balances provide the most optimistic assessment of the capability to meet demand through the winter season. To the extent that customers are unwilling or unable to deliver supply to the SoCalGas system at these assumed levels, the curtailment of noncore demand will increase from those figures calculated in Tables 7 and 8 in order to maintain core reliability.