

Question 1:

What is the maximum velocity of gas flow from Aliso to major Intrastate or Interstate pipelines? What is the maximum flowrate from Aliso Canyon Storage under current and anticipated winter operating conditions?

Response 1:

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Question 2:

Is this different from the withdrawal rate? If so, please explain how.

Response 2:

No.

Question 3:

Is the flow rate limited by velocity? Please explain how.

Response 3:

The flow rate is limited by the design capacity of the withdrawal equipment as well as the existing pipeline capacities both at Aliso and on the SoCalGas system as a whole.

Question 4:

What is the total amount of injection capability usable at Playa Del Rey? Why is Playa Del Rey storage field the only other storage field that physical gas from Aliso can be injected?

Response 4:

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Question 5:

Identify all constraints that make it infeasible to flow gas from Aliso to intrastate pipelines. Does current pressure reduction in any part of your system impact the technical constraint at Aliso Storage to flow gas into Intrastate or Interstate pipeline?

Response 5:

SoCalGas lacks sufficient pipeline and compression infrastructure to deliver gas supply to interstate pipelines. The current pressure reductions do not influence SoCalGas' ability to deliver gas to other systems.

Question 6:

Identify all physical constraints that make it infeasible to flow gas from Aliso Canyon Storage to the Honor Ranch, Goleta storage fields or PG&E facilities.

Response 6:

Please refer to Responses 1, 4 and 5.

Question 7:

Identify all mitigation activities in your pipeline system and the timeframe to make physical supplies possible for gas to flow from Aliso Canyon Storage to the Honor Rancho or Goleta storage fields.

Response 7:

Please see Response 1.

Question 8:

Please explain what parts of the SoCalGas system gas from Aliso Canyon can reach under expected late December and January demand conditions.

Response 8:

Aliso Canyon supplies the Los Angeles Basin.

Question 9:

What is the total relative demand on the SoCalGas system split between the part of the system 'within the LA basin' that gas from Aliso Canyon can reach versus 'outside the LA basin' that gas from Aliso Canyon cannot reach?

Response 9:

Approximately 50% of the SoCalGas system demand is situated within the Los Angeles Basin.

Question 10:

Has the Aliso Canyon turbine replacement project completed (tie-in was scheduled to take place on December 18, 2015).

Response 10:

The tie-in work scheduled to take place on December 18, 2015 did occur, however, the turbine replacement project is still in construction. Estimated in-service date is November 2016.

Question 16:

How much gas does SoCalGas need to be able to withdraw under normal peak winter conditions (i.e. a typical cold January weekday) and what inventory does it need at Aliso Canyon versus its other fields in order to do so? For core? For non-core? Same question, but for an "extreme peak day."

Response 16:

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Question 17:

Given the current weather predictions for January and February, how would winter supplies be affected in January and February on core customers under the best and worst case Aliso Canyon inventory levels? On non-core customers?

Response 17:

Please refer to Response 16.

Question 18:

What is SoCalGas' forecast of core and noncore demand during the months of January and February and on a winter peak day? Please describe your plans to meet this demand forecast.

Response 18:

Total demand under the 1-in-10 year cold design standard is forecast to be approximately 5 BCFD; core demand under the 1-in-35 year peak day design standard is forecast at approximately 3.5 BCFD. The forecasted demand will be met with a combination of flowing supplies and storage withdrawal. The targeted inventory reduction for Aliso Canyon for the months of January and February still allow for the field to provide enough withdrawal capacity to support the forecasted core and non-core demand.

Question 19:

Given the forecasted inventory level at Aliso Canyon during Jan and Feb 2016, what is your forecast of additional cost to core and non-core customers of reduced availability of storage gas in these months?

Response 19:

At this time, SoCalGas does not expect that there will be a reduced availability of storage gas to customers in January or February 2016.

Question 20:

Does SoCalGas need any additional authorizations or tools to manage reliability on its gas system because of the Aliso Canyon storage problems?

Response 20:

Not at this time.

Question 21:

Does SoCalGas have any plans to place additional financial hedges for January and February to compensate for the decreased storage levels at Aliso Canyon? If so, how much does SoCalGas plan on spending and what hedging options would be available?

Response 21:

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Question 22:

Is there a forecast for how much gas would need to be evacuated from Aliso Canyon to extinguish the leak?

Response 22:

We expect the well to continue to leak and the rate of leakage to continue to decline as storage inventory and pressure drop. It is likely the well will eventually load up with fluids and stop leaking; however we do not have a forecast of what inventory level and/or reservoir pressure this will occur at.

Question 23:

How long will it take to evacuate gas from the reservoir to a minimal pressure if ordered to flare and/or vent gas into atmosphere? Identify all safety factors and constraints that result from flaring. What would be the flow rate if the gas could be safely flared/vented? How much gas would be lost per day?

Response 23:

If SoCalGas were ordered to flare and /or vent gas into the atmosphere, SoCalGas would be limited to its maximum withdrawal rate, which is currently approximately 1.5 Bcf per day (see Response 1). This is because withdrawal results in byproducts such as brine water, crude oil and sand, and the gas must be processed through our dehydration plants prior to flaring. Therefore, flaring/venting would not evacuate gas from Aliso more quickly than our current withdrawal efforts. Safety factors and constraints from flaring include the following:

Site Constraints:

- Physical Space - Safely flaring these volumes of gas would require multiple pieces of very large equipment (flares, incinerators or thermal oxidizers). Such an installation would require a large physical space located at a safe distance from gas handling and processing equipment and combustible materials/vegetation. Due to the rugged and uneven terrain at Aliso Canyon, such a location does not currently exist. A very large earthmoving/grading project would be required to prepare a pad (or pads) adequate for this service. The time necessary to accomplish this would be significant.
- Process Equipment – The engineering, permitting, procurement and installation of the facilities that would be required to safely flare these volumes would be extensive and would require a significant amount of time to complete.

Safety Factors:

- Ignition Source – any flare device would create an significant ignition source and radiant heat.
- Upset Conditions – flare would need to be designed to handle process upset conditions, such as liquids in the line, oxygen in the line, etc.
- Offsite Impacts – an analysis of potential offsite impacts, such as health risks, from combustion emissions would be required.

Question 24:

Identify safety implications of using flaring to reduce the leak's environmental and health impacts.

Response 24:

Please see Response 23.

Question 25:

Please indicate what the current Northern Zone and Southern Zone receipt point capabilities are given the limitations posted on Envoy on December 10. Is there any room to increase these and what are risks of doing so?

Response 25:

The Northern Zone Capacity posted on Envoy as of 12/23/15 was 525 MMCFD. The Southern Zone capacity posted on Envoy as of 12/23/15 was 700 MMCFD. The System Operator reviews the capacity reductions each day and adjusts the available capacity to the maximum amount possible which still allows for the maximum withdrawal of gas from the Aliso Canyon storage field and also maintains system integrity.

Question 26:

What is the reason for the maintenance schedule posted on Envoy showing a reduction in Aliso Canyon withdrawal capability due to ‘ongoing operations at Aliso Canyon?’

Response 26:

Please refer to Response 1.

Question 27:

What negative consequences would occur if SoCalGas further relaxed the imbalance rules and forgave under-delivery penalties to customers located in the LA basin?

Response 27:

SoCalGas is already doing this by declining to call low OFOs on most days. Notice of this change has been posted on Envoy and has been explained to the CPUC Energy Division. Relaxing imbalance rules and waiving under-delivery penalties may lead to supply shortages. This can be tolerated only up to a certain extent. Further relaxation of SoCalGas’ imbalance rules could jeopardize system integrity and require the curtailment of noncore customer demand, including electric generating facilities, in order to maintain service to core customers.

Question 28:

Please break net imbalance into its over-deliveries and under-deliveries component parts. What customers are tending to still over-deliver? How many are located within the LA basin?

Response 28:

The location of customers who are under/over delivering is independent of system needs since customers are allowed to deliver at any receipt point that they choose or to utilize existing storage injection and withdrawal. The most effective way to make sure SoCalGas can maintain system integrity and also withdraw gas from Aliso is to reduce the receipt point capacities as is currently being implemented. We do not believe any further restrictions are necessary on customers at this time to meet these two operational goals.

Question 29:

Has SoCalGas communicated with customers to encourage under-deliveries and use of gas from storage?

Response 29:

Yes. Envoy notices have been posted, reducing the receipt point capacities. Please see Response 28.

Question 30:

Has SoCalGas evaluated the potential to use CNG trailers to capture more gas from Aliso Canyon? How much gas could that capture? What is cost? What are logistics?

Response 30:

Yes, preliminary evaluation of systems to compress and redirect captured natural gas were evaluated at a high level. This included compression and injection of captured gas into existing piping systems within the Aliso Canyon Storage Field as well as CNG Trailers. These alternatives are not considered viable due to the possibility of oxygen entrainment in the gas stream, the complexity of compression (multiple stages would be required) and horsepower requirements, and pipeline capacity. Use of CNG Trailers would add additional logistical complexities due the large number of trailers required.

Question 31:

Has SoCalGas conferred with Occidental on ability to use any of their storage and/or shut in any production?

Response 31:

Yes. However, as explained in Responses 1 and 4, the location of Occidental's assets make it infeasible to deliver Aliso Canyon gas to Occidental.

Question 32:

Why are deliveries from PG&E at Kern River Station continuing?

Response 32:

Deliveries from PG&E at Kern River Station do not impact our ability to withdraw gas supply from Aliso Canyon. Supply from both PG&E at Kern River Station and Kern/Mojave at Wheeler Ridge access parts of the SoCalGas system (the San Joaquin Valley and Coastal Systems) that Aliso Canyon cannot support and are important to supporting that part of SoCalGas' system.

Question 33:

Is SoCalGas connected to the High Desert power plant and is there any room there to displace other deliveries?

Response 33:

No, Southwest Gas supplies the High Desert power plant.

Question 34:

What other mitigation activities SCG will deploy if the Relief Wells and current effort does not reduce or cure the rate and quantity of gas leak at Aliso Storage?

Response 34:

SoCalGas will continue with our focused effort to withdraw gas from the storage reservoir, thereby continuing to reduce reservoir pressure and quantity of gas leaking to atmosphere. We will also continue to evaluate the feasibility of additional well pumping operations to stop the leak, as well as connecting the well to our piping system to flow the well if conditions are safe. In addition, SoCalGas will continue to move forward with our efforts to implement feasible collection and treatment system(s) to minimize the impacts of the leaking gas (See Responses 35 and 36 for additional details).

Question 35:

Provide the status of the "recovery wells" or other, more sophisticated methods of trying to "capture" and dispose of some of the leaking gas at Aliso Canyon.

Response 35:

Working with our experts, AECOM and Fluor, and with close consultation with Boots & Coots and other consultants, we have been assessing the viability of a number of alternatives to mitigate the gas leaking from SS25. The recovery well option looked promising but ultimately safety concerns over managing the potentially high pressure that would be encountered were too great. Several other above-ground alternatives, such as those presented on the 09Dec15 briefing, have also and continue to be evaluated. A significant risk in developing any system to capture/collect the natural gas leaking from SS25 is oxygen entrainment in a process stream with methane and creating an explosive gas mixture. Another significant risk in a capture/collect system is creating backpressure that unfavorably changes the behavior of the leaking gas. Ultimately, the risk of oxygen entrainment combined with the requirement to not introduce backpressure on the leak eliminated all alternatives that could potentially capture all, or a great majority of the leaking gas. The option with the primary focus is a hybrid capture and oil knockout structure that could potentially capture some of the gas or at a minimum, knock-out entrained oil. Captured gas would be pulled off via blowers and piped to incinerators or carbon beds and vented. Final engineering was complete and procurement/fabrication was initiated but then put on hold after the 22Dec15 unsuccessful well kill effort. Changing site conditions due to the well kill effort require a change in engineering/design of the capture structure. Preliminary engineering and material/equipment sourcing for the gas disposition systems is complete.

Question 36:

Are these methods experimental or proven practical methods? Please provide citations documenting either type of method.

Response 36:

The gas processing methods being contemplated (e.g. using coalescing materials to knock-out entrained oil in a process stream, blowers to move gas, incineration, use of carbon beds to knock out Mercaptans or other constituents, etc.) are commonly used in the process industry. Engineering, constructing, and operating a capture/collection structure(s) to safely account for the unique characteristics of the site conditions at SS25 that would feed a gas processing system is certainly unique and requires innovative conceptual thinking. Basic engineering principals, however, are being applied to any capture/collection concept.

Question 37:

What are safety implications on the transmission from the ongoing leak at Aliso Canyon?

- a. Are any Pipeline Safety Enhancement Plan projects being postponed (e.g. replacements)
- b. Is SoCalGas operating any pipelines at significantly higher pressures (within MAOP but significantly above recent MOP) than in recent years to accommodate the gas

Response 37:

- a. Not at this time.
- b. No.

Question 38:

Residents of Porter Ranch are being exposed to mercaptan, which will reduce their ability to smell a local gas leak on SoCalGas distribution lines or in the house. What steps is SoCalGas taking to ensure the safety of the community where residents may not be able to smell gas and notify the company?

Response 38:

The presence of natural gas odorants tertiary-butyl mercaptan and tetrahydrothiophene (the two odorants present in the SS-25 gas) in the Porter Ranch community is highly dependent upon local wind conditions and general meteorology. When northerly winds prevail, the natural gas constituents including odorant can be carried into the nearby Porter Ranch community. Therefore the presence of odorant in the community is intermittent in nature and highly variable. SoCalGas has conducted twice daily air monitoring in approximately ten (10) locations within the community since October 30, 2015 and levels above the 5 ppb laboratory detection limit have not been found although the olfactory detection level can be as low as 1 ppb. We anticipate that should a local gas leak occur within the community, the presence of natural gas odorant would be consistently detected within the immediate vicinity of the leak source, persistent and therefore distinguishable. Moreover, SoCalGas continues to offer home relocation services, air cleaner systems and weather stripping to reduce the impact of odorant in the community. SoCalGas is also actively working with two engineering firms to design, build and permit a gas capture system at the SS-25 wellhead to reduce the presence of odorant in the community. SoCalGas is also reducing the amount of emissions from SS-25 into the community by continually withdrawing gas from the Aliso storage field and reducing the overall field pressure and the pressure in the immediate vicinity of SS-25. This activity was first initiated on November 12 and continues to the present.

Question 39:

Explain why the wellhead was oscillating during the last well-kill operation and SCG's detail contingency plan to prevent a catastrophic failure of the wellhead.

Response 39:

The wellhead was moving during the well-kill operations due to a mixture of gas and fluid reaching the surface during the pumping operations. In addition, supporting soil directly around the well had been displaced during prior pumping operations. The resulting force caused by the mixture of gas, fluids and soil being eroded from around the well during the operations, caused the well to move. In order to mitigate that movement and prevent a failure of the wellhead, the wellhead was secured at the surface by using various ¾ " steel cables connected to the bridge structure at four points and other anchor points on the site. Future contingency plans to prevent a catastrophic failure of the wellhead, would be first to not pump on the well, and if another pump job is attempted, to further secure the wellhead at the surface.