

Docket:	<u>A.19-06-016</u>
Exhibit Number:	<u>CalPA 405</u>
Reference Number:	<u>CalAdvocates-04</u>
Date Served:	<u>March 24,2021</u>
Commissioner:	<u>C. Rechtschaffen</u>
Admin. Law Judge:	<u>Poirier/Kenney</u>



**THE PUBLIC ADVOCATES OFFICE**  
**CALIFORNIA PUBLIC UTILITIES COMMISSION**

**Order Instituting Investigation on the Commission's Own Motion  
into the Operations and Practices of Southern California Gas  
Company with Respect to the Aliso Canyon storage facility and the  
release of natural gas, and Order to Show Cause Why Southern  
California Gas Company Should Not Be Sanctioned for Allowing  
the Uncontrolled Release of Natural Gas from Its Aliso Canyon  
Storage Facility**

**Cal Advocates Supplemental Response to SoCalGas DR-01**

San Francisco, California  
March 24, 2021



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California Public Utilities Commission

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**PUBLIC ADVOCATES OFFICE SUPPLEMENTAL RESPONSES TO  
SOUTHERN CALIFORNIA GAS COMPANY'S FIRST SET OF DATA REQUESTS,  
QUESTIONS 7-12**

**Order Instituting Investigation into SoCalGas' Practices and Operations of the Aliso  
Canyon Storage Facility and the Uncontrolled Release of Natural Gas,  
I.19-06-016**

Data Request No: SoCalGas-CalAdvocates-01

Original Date of This Request: January 9, 2020

Original Response Date: January 24, 2020

Supplemental Response Date: February 11, 2020 [Questions 7, 8, 9, 10, 11, 12]

**GENERAL OBJECTIONS**

The Public Advocates Office provides the following Supplemental Responses (Supplemental Responses) to Southern California Gas Company's (SoCalGas) First Set of Data Requests to the Public Advocates Office dated January 9, 2020 (SoCalGas DR 1), Questions 7-12 only. Relevant questions from SoCalGas DR 1 are reproduced below, followed by Public Advocates Office Original Responses and Supplemental Responses, solely for ease of reference. The Public Advocates Office does not adopt or admit any question or any portion of any question as correct or true. The Public Advocates Office reserves the right to supplement, clarify, revise, or correct any or all of the Supplemental Responses and objections herein, and to assert additional objections or privileges, in one or more subsequent supplemental response(s).

The Public Advocates Office objects to each data request to the extent it mischaracterizes Public Advocates Office Opening Testimony.

The Public Advocates Office objects to each data request to the extent it is overly broad, unduly burdensome, or not reasonably calculated to lead to the discovery of admissible evidence.

The Public Advocates Office objects to each instruction, definition, and data request to the extent that it seeks information or documents protected from disclosure by the attorney-client privilege, attorney work product doctrine, or any other applicable privilege.

The Public Advocates Office objects to each instruction, definition, and data request as overbroad and unduly burdensome to the extent it seeks documents or information that are readily or more accessible to SoCalGas from SoCalGas's own files, from documents or information in SoCalGas's possession, or from documents or information that SoCalGas previously produced to the Public Advocates Office. Responding to such requests would be



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oppressive, unduly burdensome, and unnecessarily expensive, and the burden of responding to such requests is substantially the same or less for SoCalGas as for the Public Advocates Office. All such documents and information will not be produced.

The Public Advocates Office incorporates by reference every general objection set forth above into each specific response set forth below. A specific response may repeat a general objection for emphasis or some other reason. The failure to include any general objection in any specific response does not waive any general objection to that request.

### **DEFINITIONS**

1. "LEAK" refers to the SS-25 natural gas leak that occurred on October 23, 2015.
2. "SoCalGas" refers to Southern California Gas Company and/or its affiliates.

### **DATA REQUESTS AND SUPPLEMENTAL RESPONSES TO QUESTIONS 7-12**

YOU allege on pages 8-9 of YOUR PREPARED TESTIMONY that:

Using an assumption that the production casings of each well would have had 0 percent Outer Diameter (OD) penetration (wall thickness loss) at the time they were installed and the percentage of OD Penetration found by the Vertilog results in 1988, it is possible to estimate a localized linear corrosion rate in units MPY. From the results in Table 1, the wells given Vertilog inspections had a corrosion rate from 1.4 to 4.6 MPY.<sup>39</sup> Given the almost 5 MPY corrosion rate and an existing wall thickness loss exceeding 60 percent, the wall thickness would be reduced to 80 percent in as few as 14 years, or by 2002. [Footnote 40 omitted] ... SoCalGas failed to perform this basic corrosion rate calculation with the 1988 Vertilog results, leaving SoCalGas' management uninformed and unable to assess the risk of casing failure events.

Footnote 39 provides the following citation:

In an open water system, a corrosion rate of around 1 MPY is normal. Having corrosion rate of around 10 [MPY], you should take action. Corrosion rates of 20 MPY and above, you should be concerned, as the corrosion is "eating" the metal rather fast. Merus Oil and Gas, <https://www.merusonline.com/mpy-milspcr-year/>.

With this reference in mind, please answer the following:



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### **Question 7**

Assuming the accuracy and reliability of YOUR corrosion rate calculation for Porter 37 (4.5 MPY as of 1988), what remedial action(s), if any, do YOU contend SoCalGas should have taken in or around 1988 respecting well Porter 37?

### **Original Response to Question 7**

The Public Advocates Office objects to this question on the ground that SoCalGas attempts to shift the burden of investigation and maintenance of its wells contrary to PU Code Section 451. The Public Advocates Office further objects to the question on the grounds that this question is unduly burdensome in that it requires the Public Advocates Office to gather and analyze all the information that is or was in SoCalGas's sole possession and control. The Public Advocates Office further objects that information responsive to this question is in SoCalGas's sole possession and control.

Subject to and without waiver of the foregoing objections, the Public Advocates Office responds as follows:

Please see Opening Testimony, page 9, which states: "Given the poor condition of the inspected wells, it would have been prudent for SoCalGas management to confirm that the remaining 13 wells did not also have compromised integrity. SoCalGas management failed to do so. Instead it claimed that continued Vertilog inspections would not have achieved SoCalGas' intended purposes of the 1988 program. Even if this claim is correct, SoCalGas' management could still have confirmed the integrity of the remaining 13 wells through other measures, such as pressure testing, as SoCalGas had originally proposed."

Please also see the Blade Report, page 219:

When a failure of some component in a system occurs, it is not uncommon to conduct a failure analysis depending on the severity of the failure and its consequences. The purpose of the failure analysis is to determine why it happened, how to prevent its recurrence, and, of equal importance, determine if it was because of an isolated problem or if it was a potentially systemic problem. If the problem appears to be systemic, then a risk assessment is commonly done to determine the likelihood of the failure occurring elsewhere, what the potential consequences might be, and how tolerable the risk is. With this understanding of the nature of the problem and potential risks, existing procedures can then be changed, or new ones developed to monitor and mitigate the risks.

... Blade's review of the Aliso Canyon well files shows that 40% of the wells had casing failures (leaks, tight spots, parted casing) with an average of 2 failures per well (99 failures in 49 wells).

... Despite this, there is no evidence that SoCalGas conducted a formal failure analysis or follow-up risk assessment on any of the casing failures to determine



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why they occurred. Nor was there an investigation of the reasons for, and the potential consequences of, the corrosion.

### **Supplemental Response to Question 7**

The Public Advocates Office contends that SoCalGas failed to properly monitor its wells for corrosion for nearly three decades from 1988 until the LEAK.

Please see Public Advocates Office Opening Testimony (Opening Testimony), page 8, which states: “The Blade Report noted that despite the evidence of wall thickness loss from the seven tested wells, SoCalGas failed to perform a data analysis of the Vertilog results.<sup>36</sup>”

Footnote 36 cites to the Blade Report Root Cause Analysis of the Uncontrolled Hydrocarbon Release from Aliso Canyon (Blade Report), page 218, which states:

Seven of the wells were inspected, and many of them had OD metal loss indications. There was no follow-up investigation of why these wells exhibited OD corrosion and why the remaining thirteen wells did not require further analyses (the remaining thirteen wells had been ranked as medium and low priority).

As stated in the Opening Testimony, SoCalGas should have performed data analysis of the Vertilog results of this well. The linear localized corrosion rate calculated in the Opening Testimony is simply one example of possible analysis that SoCalGas failed to perform in light of the data observed in the Vertilog program. The specific corrosion rate given for this well is a conservative estimate given the sparsity of SoCalGas’ wall thickness integrity inspections over the lifetime of this well. The choice of a linear corrosion rate and the resulting calculation given for this well was provided in Public Advocates Response to Question 5:

An exponential corrosion rate may have been a reasonable fit for the corrosion occurring on the production casing...

However, an issue with assuming an exponential corrosion rate is that in order to accurately document the nature of the corrosion, at least three data points are needed to fit the curve. Since SoCalGas has provided proof of only one wall thickness examination on its wellbores in their more than 60-year lifespan (Vertilog testing in 1988), there is not enough data to accurately estimate the exponential nature of the corrosion. Had SoCalGas performed other regular wall thickness measurement inspections, those data points may have better fit an exponential rate of corrosion to the wellbores.

As a result, the only available assumption is a linear local approximation of corrosion, which is a conservative estimate given the lack of data taken by SoCalGas. With the one wall thickness measurement in 1988 (for 7 of the 20 prioritized wells), and an assumption that the production casing was placed into the ground with a 0% Wall Thickness loss, it is possible to approximate a constant rate of corrosion while the casing was in the ground.



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It is important to note that this assumption would overestimate corrosion early in the lifespan of the production casing and underestimate the corrosion late in the corrosion's lifespan. However, by the time 60% Wall Thickness loss had been identified by Vertilog testing of similar casings, linear approximation would have been the conservative estimate. As time went on, actual corrosion rate would likely be a much larger MPY ("Mils Per Year") corrosion rate than the available linear assumption. The Blade Report accounts for this issue when it estimates the corrosion rate as "an average of 5 to 10 mpy."

The corrosion rate calculation works as an illustration of the fact that the wells examined by Vertilog in 1988 existed in a corrosive environment, and that some estimate of corrosion rate is possible. The precision with which the corrosion rate can be estimated is heavily affected by the lack of wall thickness monitoring by SoCalGas over the lifetime of this well. However, with the knowledge that some of its wells existed in a corrosive environment, SoCalGas should have continued monitoring the integrity of its wells, including this well. Monitoring of wall thickness from 1988 onwards could have aided in ascertaining a more accurate rate of corrosive loss, as well as shed light on how corrosive the environment was in which this well existed.

SoCalGas should have continued monitoring the integrity of all of the wells scheduled to be maintained during the 1988 Vertilog program. With the early results of corrosion evident, SoCalGas should have performed analysis of the corrosion on this well to determine if the corrosive environment was an isolated or systemic problem across the other wells in its field. Instead, SoCalGas terminated its two-year Vertilog program prior to its conclusion in 1990. SoCalGas failed to perform any broader corrosion analysis of its wellfield as per the Blade Report to justify its decision to cease implementation of the 1988 Vertilog program.

### **Question 8**

Assuming the accuracy and reliability of YOUR corrosion rate calculations for Porter 46 (1.4 MPY as of 1988), what remedial action(s), if any, do YOU contend SoCalGas should have taken in or around 1988 respecting well Porter 46?

### **Original Response to Question 8**

The Public Advocates Office objects to this question on the ground that SoCalGas attempts to shift the burden of investigation and maintenance of its wells contrary to PU Code Section 451. The Public Advocates Office further objects to the question on the grounds that this question is unduly burdensome in that it requires the Public Advocates Office to gather and analyze all the information that is or was in SoCalGas's sole possession and control. The Public Advocates Office further objects that information responsive to this question is in SoCalGas's sole possession and control.

Subject to and without waiver of the foregoing objections, the Public Advocates Office responds as follows:



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Please see Public Advocates Office's Response to Question 7.

### **Supplemental Response to Question 8**

Please see Public Advocates Office's Supplemental Response to Question 7.

### **Question 9**

Assuming the accuracy and reliability of YOUR corrosion rate calculations for Standard Sesnon 8 (3.0 MPY as of 1988), what remedial action(s), if any, do YOU contend SoCalGas should have taken in or around 1988 respecting well Standard Sesnon 8?

### **Original Response to Question 9**

The Public Advocates Office objects to this question on the ground that SoCalGas attempts to shift the burden of investigation and maintenance of its wells contrary to PU Code Section 451. The Public Advocates Office further objects to the question on the grounds that this question is unduly burdensome in that it requires the Public Advocates Office to gather and analyze all the information that is or was in SoCalGas's sole possession and control. The Public Advocates Office further objects that information responsive to this question is in SoCalGas's sole possession and control.

Subject to and without waiver of the foregoing objections, the Public Advocates Office responds as follows:

Please see Public Advocates Office's Response to Question 7.

### **Supplemental Response to Question 9**

Please see Public Advocates Office's Supplemental Response to Question 7.

### **Question 10**

Assuming the accuracy and reliability of YOUR corrosion rate calculations for Standard Sesnon 9 (1.5 MPY as of 1988), what remedial action(s), if any, do YOU contend SoCalGas should have taken in or around 1988 respecting well Standard Sesnon 9?

### **Original Response to Question 10**

The Public Advocates Office objects to this question on the ground that SoCalGas attempts to shift the burden of investigation and maintenance of its wells contrary to PU Code Section 451. The Public Advocates Office further objects to the question on the grounds that this question is unduly burdensome in that it requires the Public Advocates Office to gather and analyze all the information that is or was in SoCalGas's sole possession and control. The Public Advocates Office further objects that information responsive to this question is in SoCalGas's sole possession and control.



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Subject to and without waiver of the foregoing objections, the Public Advocates Office responds as follows:

Please see Public Advocates Office's Response to Question 7.

**Supplemental Response to Question 10**

Please see Public Advocates Office's Supplemental Response to Question 7.

**Question 11**

Assuming the accuracy and reliability of YOUR corrosion rate calculations for Frew 4 (4.6 MPY as of 1988), what remedial action(s), if any, do YOU contend SoCalGas should have taken in or around 1988 respecting well Frew 4?

**Original Response to Question 11**

The Public Advocates Office objects to this question on the ground that SoCalGas attempts to shift the burden of investigation and maintenance of its wells contrary to PU Code Section 451. The Public Advocates Office further objects to the question on the grounds that this question is unduly burdensome in that it requires the Public Advocates Office to gather and analyze all the information that is or was in SoCalGas's sole possession and control. The Public Advocates Office further objects that information responsive to this question is in SoCalGas's sole possession and control.

Subject to and without waiver of the foregoing objections, the Public Advocates Office responds as follows:

Please see Public Advocates Office's Response to Question 7.

**Supplemental Response to Question 11**

Please see Public Advocates Office's Supplemental Response to Question 7.

**Question 12**

Assuming that as of 1988 SS-25 had a "normal" corrosion rate of "around 1 MPY," as cited in footnote 39 of YOUR PREPARED TESTIMONY, what remedial action(s), if any, do YOU contend SoCalGas should take taken?

**Original Response to Question 12**

The Public Advocates Office objects to this question as it mischaracterizes the Opening Testimony. The Public Advocates Office further objects to this question on the ground that SoCalGas attempts to shift the burden of investigation and maintenance of its wells contrary to PU Code Section 451. The Public Advocates Office further objects to the question on the grounds that this question is unduly burdensome in that it requires the Public Advocates Office to gather and analyze all the information that is or was in SoCalGas's sole possession and



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control. The Public Advocates Office further objects that information responsive to this question is in SoCalGas's sole possession and control.

Subject to and without waiver of the foregoing objections, the Public Advocates Office responds as follows:

Question 12 mischaracterizes the findings of the Blade Report, which determined the corrosion rates to have been 'an average of 5 to 10 mpy.' (Blade Report, page 124.) Further, please see Public Advocates Office's Response to Question 7.

### **Supplemental Response to Question 12**

Question 12 requests the assumption that SS-25 had "a 'normal' corrosion rate of 'around 1 MPY.'" However, as a direct result of SoCalGas failing to perform Vertilog testing on SS-25 as part of its 1988 Vertilog program or in the nearly three decades to follow, SoCalGas cannot assume any corrosion rate (whether "normal" or not) for SS-25. Question 12 also mischaracterizes the findings of the Blade Report, which through Blade Partners' own analysis, determined the corrosion rate of SS-25 to have been "an average of 5 to 10 mpy." (Blade Report, page 124.)

Despite the fact that (1) it is impossible to make any assumptions regarding SS-25's corrosion rate in 1988 or thereafter due to a lack of SoCalGas Vertilog testing of SS-25 and (2) the Blade Report's best estimate of a corrosion rate of SS-25 at "an average of 5 to 10 mpy," the Public Advocates Office contends that a "normal" corrosion rate of "around 1 MPY" would require continued monitoring of the wall thickness loss and continued monitoring of the wellbore integrity of SS-25.

SoCalGas should have continued monitoring the integrity of all of the wells scheduled to be maintained during the 1988 Vertilog program, including SS-25. With the early results of corrosion evident in wells Porter 37, Porter 46, Standard Sesnon 8, Standard Sesnon 9, and Frew 4, SoCalGas should have performed analysis of the corrosion on the remaining 13 candidate wells in 1988 to determine if the corrosive environment was isolated to the initial five wells or rather a systemic problem across the other wells in the field. Instead, SoCalGas terminated its two-year Vertilog program prior to its conclusion in 1990, without investigating broader corrosion of the wellfield or determining what remedial actions, if any, were necessary.

Had SoCalGas continued with the 1988 Vertilog program as anticipated and continued monitoring SS-25 between 1988 and 2015, SoCalGas would have been able to timely remediate the corrosion issues on SS-25 including monitoring them to accurately measure the rate of corrosion. As a result, SoCalGas' continued monitoring and timely actions could have prevented the LEAK. Please also see Blade Report, Volume 4, "Review of 1988 Candidate Wells for Casing Inspection" Supplementary Report, page 2: "There is no way to know what an inspection of the SS-25 casing would have shown in 1988, but it is possible that corrosion was present and detectable, and steps could have been taken to avoid the leak in 2015."



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## **END OF DATA REQUESTS AND SUPPLEMENTAL RESPONSES**

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