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December 1, 2015

**VIA E-MAIL AND OVERNIGHT EXPRESS**

John Laird, California Secretary for Natural Resources  
Natural Resources Agency  
1416 Ninth Street, Suite 1311  
Sacramento, CA 95814

David Bunn, Director of Department of Conservation  
California Department of Conservation  
801 K Street, MS 24-01  
Sacramento, CA 95814

Steve Bohlen, State Oil & Gas Supervisor  
California Department of Conservation  
**Division of Oil, Gas, and Geothermal Resources**  
801 K Street, MS 18-05  
Sacramento, CA 95814-3530

Re: Aliso Canyon Gas Leak

Dear Secretary Laird, Director Bunn, and State Oil & Gas Supervisor Bohlen,

Southern California Gas injects natural gas underground – the injection well activities led to the leaking of massive amounts of methane near families in Porter Ranch, a residential community in Los Angeles County. We represent Save Porter Ranch and members of the Porter Ranch community. Save Porter Ranch is demanding the State Oil & Gas Supervisor issue an emergency order requiring So. Cal. Gas to stop all injections in this oilfield by December 3, 2015. Public Resources Code sections 3013, 3106, 3224, 3326, 3300 and 3403.5 give the State Oil & Gas Supervisor this authority. Public Resources Code section 3235 mandates an investigation, written report, and order by the State Oil & Gas Supervisor on receipt of this complaint.

DOGGR should have issued such an order weeks ago. As DOGGR knows, on or before October 23, 2015, So. Cal. Gas detected an uncontrolled flow of fluids and gas from one of its injection wells in the Aliso Canyon Oil Field. So. Cal. Gas attempted to “kill” the well by filling the well bore with heavy brine to stop gas from escaping. (See Attachment 1.) This plan failed. Additional attempts to kill the well with a barite solution also failed. (See Attachment 2.) With no other remedies available, So. Cal. Gas now seeks to drill a new well to overcome the reservoir pressure. (See Attachment 3.) This process will take three to four months, and there is no guarantee of success.

LAWYERS **PROTECTING** YOU

Save Porter Ranch is also demanding the State Oil & Gas Supervisor immediately disclose all test data received from So. Cal. Gas regarding the chemicals being released. DOGGR's November 18, 2015 Emergency Order required So. Cal. Gas to provide this data, and thus, DOGGR should immediately upload this information to the internet. DOGGR's failure to provide this information only increases the concern that DOGGR may be protecting So. Cal. Gas at the expense of the residents of Porter Ranch.

The injection well that is leaking is one of 154 injection wells in this oil field including 93 active gas storage wells. DOGGR's prior emergency order did not order So. Cal. Gas to immediately stop injection activity in this field, and DOGGR's failure to act is increasing the risk to the community. Indeed, there are 93 active gas storage wells injecting into the Sesnon-Frew reservoir, the same reservoir as well 03700776. (See Attachment 4, List of Aliso Canyon Injection Wells.) The risks are compounded because there are at least 22 gas storage wells that are idle and thus can serve as conduits (or straws) transporting the gas from one area to another.

The most recent data shows that in one month So. Cal. Gas injected over **5.7 billion** cubic feet natural gas into the Sesnon-Frew reservoir. (See Attachment 5, DOGGR Gas Injection Data.) The difficulties faced by So. Cal. Gas in controlling the high-pressure leak in one injection well are surely exacerbated by any continued high-pressure injection of **billions** of cubic feet of natural gas into the same shared gas-storage reservoir. Of greater concern, the continued injections create a serious public health risk for the families in Porter Ranch.

On October 8, 2015, DOGGR admitted that upwards of 78% of the injection wells in Los Angeles County allowed injections without protecting from the migration of the gas or waste into idle wells nearby. (See Attachment 6.) None of the injection wells appears to comply with the UIC regulations under 14 CCR 1724.7 and 1724.9 – including the lack of an area of review analysis required to ensure zonal isolation of injectate. DOGGR records also suggest that DOGGR has not required So. Cal. Gas to properly report all injection pressure as required by 14 CCR 1724.10. (See Attachment 5.)

In addition to gas injection wells, there are 11 other injection wells operated by So. Cal. Gas in this oil field. These other injection wells include active waterflood and waste disposal wells. DOGGR also issued permits for these injection wells without requiring that So. Cal. Gas follow the UIC regulations protecting the public, and again, there is an incomplete record of injection pressure data. (See Attachment 7, DOGGR Water Injection Data.)

In the rare instances where So. Cal. Gas reported injection pressure, it appears that these wells may be injecting wastewater at or above the formation fracture pressure. (See Attachment 3, p. 2 (So. Cal. Gas estimates that the formation fracture gradient is 0.80 psi/ft); Attachment 7 (demonstrating wastewater injection at 1,500 psi in a well with a top perforation at 3,764 feet); Attachment 8, Excerpt from June 2011 Horsley Witten Group DOGGR Class II UIC Program Review (discussing maximum allowable surface pressure calculation).) Given the unknown degree to which the Aliso Canyon formations have already been damaged, our clients request that DOGGR's order blocking all injection activities also block water injection at least until So. Cal. Gas obtains control over the leaking gas.

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Other operators in this oilfield obtained injection well permits. It is unclear from DOGGR's website whether any other injection wells are operational. DOGGR should also investigate what the other oil companies with operations in this oil field do with their waste water. Obviously it must be disposed of by these operators, and thus far, there are no records demonstrating disposal in properly permitted injection wells. DOGGR confirm there are no other injection wells that could be impairing the ability of So. Cal. Gas to stop the leak.

Let there be no mistake about the impact this leak is having on the families in Porter Ranch. Almost 300 families had to evacuate during this holiday season. The families in this community live here because it is supposed to be safe, and now it is not. Children and adults suffer from regular nosebleeds, headaches, nausea and vomiting. These families have a right to live without toxic poisoning of their neighborhood.

The amount of methane being released from So. Cal. Gas's gas injection well is estimated to be upwards of 50,000 kilograms of methane an hour, potentially accounting for a quarter of California's total methane emissions every day the leak continues. (See Attachment 9, Air Resources Board Report.) Residents are afraid to open their windows, forced to perpetually run their air conditioners, and are finding oily residue in their swimming pools.

**In sum, Save Porter Ranch demands that DOGGR issue an order by December 3, 2015 that provides the following protections to the families of Porter Ranch:**

1. So. Cal. Gas must cease all injections other than injections approved by DOGGR to stop the massive leak.
2. DOGGR must disclose all chemicals detected in air quality tests as provided by So. Cal. Gas and any government agency.
3. DOGGR must investigate and confirm no other injection activities by other operators are impairing the ability of So. Cal. Gas to stop the leaking well.

If DOGGR fails to act, we plan to challenge DOGGR's inaction and to seek all available damages for the personal injuries suffered and the taking of our Clients' property rights in violation of the United States Constitution. Save Porter Ranch can be reached through its Counsel, R. Rex Parris Law Firm at 43364 10<sup>th</sup> Street West, Lancaster, California 93534.

Sincerely,



R. Rex Parris  
R. Rex Parris Law Firm  
Attorneys for Save Porter Ranch

cc: Governor Edmund G. Brown ([governor@governor.ca.gov](mailto:governor@governor.ca.gov))  
Attorney General Kamala D. Harris ([attorneygeneral@doj.ca.gov](mailto:attorneygeneral@doj.ca.gov))

LAWYERS **PROTECTING** YOU

Re: Aliso Canyon Gas Leak

December 1, 2015

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Eric Garcetti (mayor.garcetti@lacity.com)

Mitchell Englander (councilmember.english@lacity.org)

John Geroch (john.geroch@conservation.ca.gov)

Alan Walker (alan.walker@conservation.ca.gov)

Southern California Gas Company

LAWYERS **PROTECTING** YOU

R. Rex Parris | Robert A. Parris | Alexander R. Wheeler | Jason P. Fowler | Bruce L. Schechter  
Kitty K. Szeto | Patricia K. Oliver | Ryan K. Kahl | Breanna L. Kenyon | John M. Bickford | Jacob L. Karczewski  
Naomi C. Pontious | Jonathan W. Douglass | Sean J. Lowe | Eric N. Wilson | Ethan T. Litney | Bernadette N. Manigault

ATTACHMENT 1

# ALISO CANYON STORAGE FACILITY UPDATE

NOVEMBER 12, 2015



## BACKGROUND

On October 23, SoCalGas crews discovered a leak at one of the natural gas storage wells at our Aliso Canyon storage field. After conducting our normal procedures to stop the leak, we realized that additional expertise and equipment were needed in this situation. We brought in a team of world-class experts to help us, and have since been working as

quickly as safety will allow, to stop the leak.

We have been working closely with all of the appropriate public agencies, including the L.A. City and County Fire Departments and Hazmat Departments, the L.A. County Department of Health, the California Division of Oil, Gas & Geothermal Resources, and the South Coast Air Quality Management District.

We sincerely apologize for any concern this odor is causing the neighboring communities. However, the leak does not pose an imminent threat to health or public safety. The well is located in an isolated, mountain area more than a mile away from and more than 1,200 feet higher than the closest home or public area. Scientists agree natural gas is not toxic and that its odorant is not toxic at the minute levels at which it is added to natural gas. Health and air-quality officials said that the levels of the additive found in air samples taken in Porter Ranch should not pose a health problem.



**“WE ARE SORRY FOR THE CONCERNS THE LEAK AND ITS ODOR MAY HAVE CAUSED YOU. WE ARE COMMITTED TO WORKING AS QUICKLY AS SAFETY WILL ALLOW TO STOP THE FLOW OF NATURAL GAS”**

## CONTENT

- 1 Aliso Canyon Natural Gas Background
- 2 Situation Update
- 2 Health Questions
- 2 Claims Information
- 2 SoCalGas’ Commitment to the Environment
- 3 Well Diagrams
- 4 Progress Timeline
- 4 Contact Information



A  Sempra Energy utility

## SITUATION UPDATE

As of Wednesday November 11, SoCalGas' team of well management experts have cleared the ice blockage in the well and completed a multi-day operation of successive probes and tests.

We have collected and analyzed all available data obtained during the diagnostics, and we are now preparing and planning our approach to stop the flow of gas. We have some of the world's best experts advising us, and they owe their success to their cautious approach.

The leak site remains safe because it's in a localized area more than a mile away from homes and businesses. Natural gas continues to leak from the pipe casing and is seeping from the ground areas near the well; however, it is not blowing at high pressure.



## HEALTH QUESTIONS

Once again, we apologize to our neighbors and residents who may be affected by the odor of natural gas. Although natural gas is not considered to be toxic or a hazardous air pollutant, it does smell bad. Odors affect everyone differently and some people may feel ill from the smell. We encourage people to call a doctor if they feel they need to. We apologize for any discomfort the odors may be causing you or your family.

To help provide the public with more information, we are taking air samples regularly. The results are posted on [socialgas.com](http://socialgas.com).

If you have health questions you can contact the L.A. County Department of Health at (888) 700-9995.

## CLAIMS INFORMATION

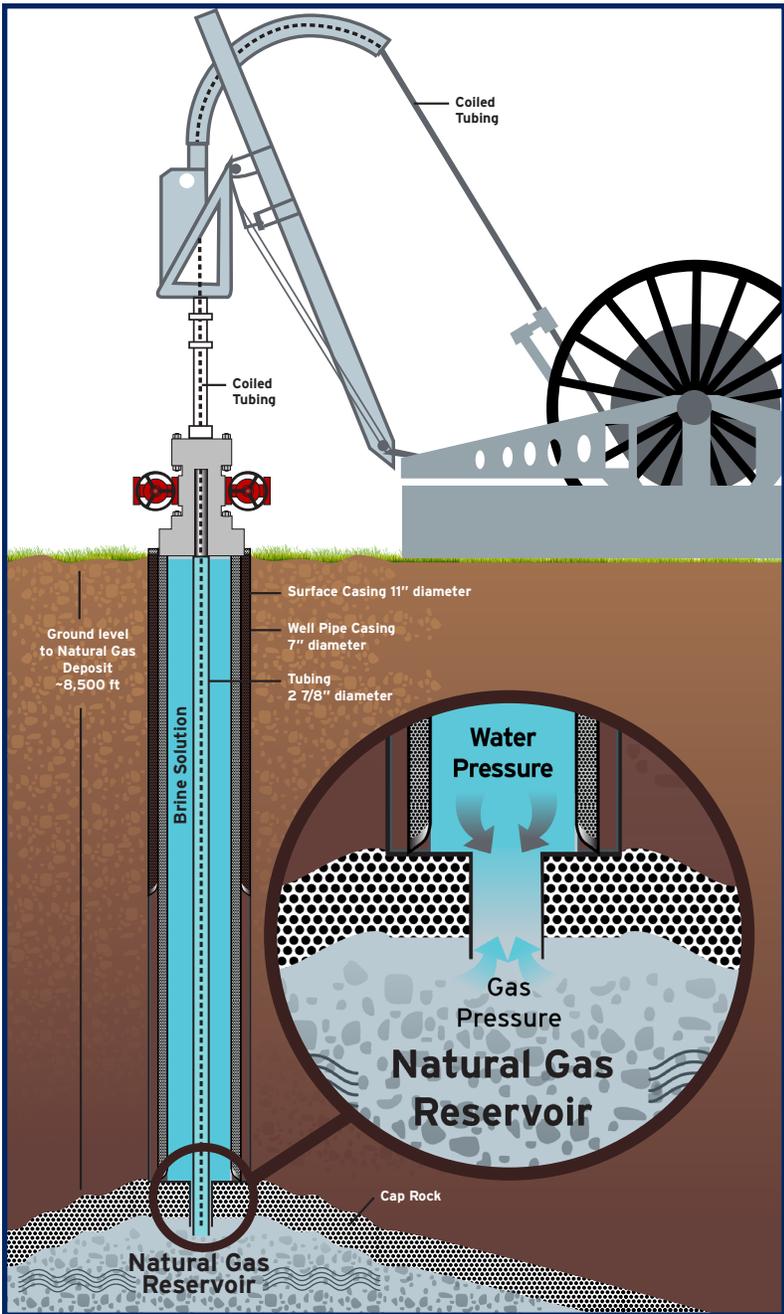
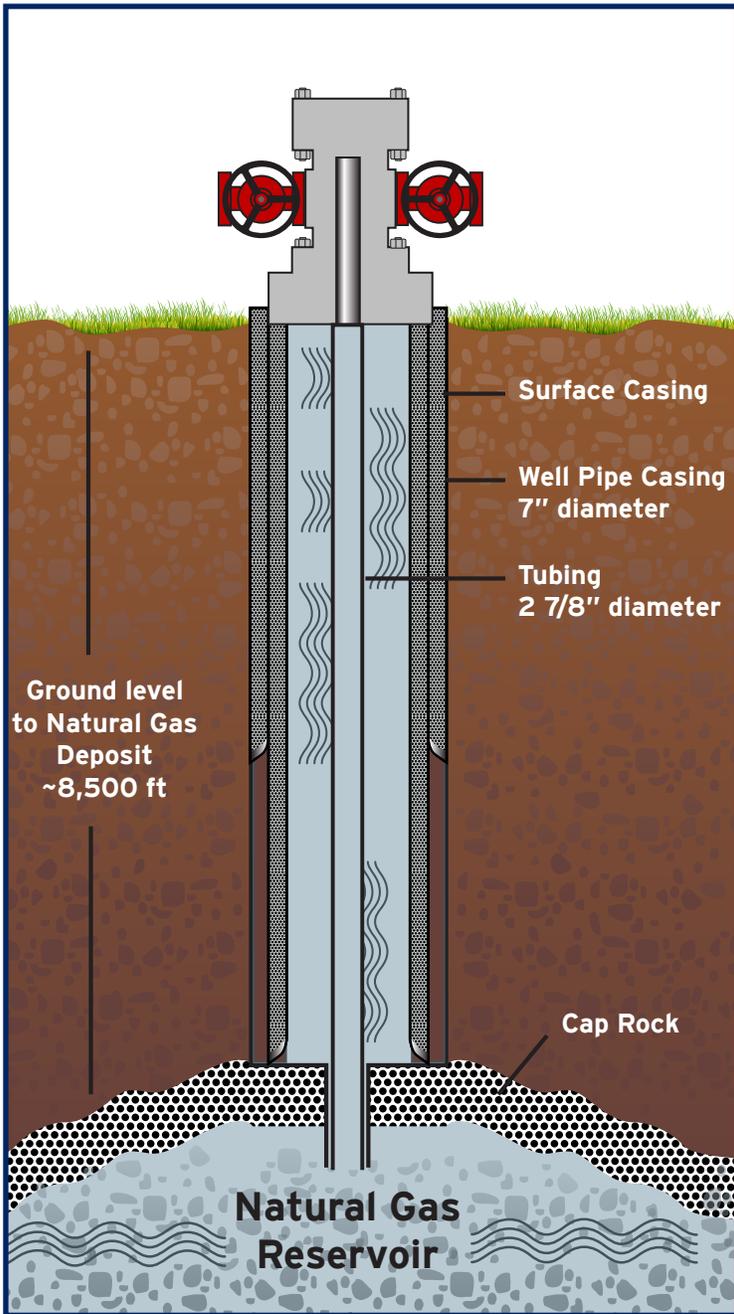
If you believe you have suffered harm or injury as a result of this incident, please call 213-244-5151 to speak to a claims representative.

You can also download a Claims Form at: [socialgas.com/about-us/our-services/consulting/claims.shtml](http://socialgas.com/about-us/our-services/consulting/claims.shtml)

Mail or fax the form to:  
Southern California Gas Company  
Attention: Claims Department  
P. O. Box 60980  
Los Angeles, California 90060-0980  
Fax number 213-244-8214

## SOCALGAS' COMMITMENT TO THE ENVIRONMENT

We are committed to resolving the situation quickly, not only to alleviate our neighbors' concern, but also to reduce the environmental impact. We're working hard to reduce the flow of natural gas and stop the leak as quickly as possible. Reducing what are called "fugitive emissions" that contribute to climate change has been an extremely high priority for SoCalGas for many years. As a result, our distribution system has one of the lowest fugitive emissions rates in the country. We genuinely care about the environment, and we are presently working with our team of experts and regulatory agencies to reduce the impact of the leak to the environment and surrounding community. Once the leak is stopped, we will work with the appropriate agencies to evaluate and address the environmental impact of this leak.



**FIGURE 1**

**Natural Gas Well Leak**

Indicators are that natural gas is leaking from the well pipe casing into the ground near the well.

**FIGURE 2**

**Current Efforts to Remedy the Leak**

The goal is to fill the well pipe with enough brine solution to stop the flow of natural gas.

SoCalGas' team of experts will fill the well pipe with enough brine solution to out weigh the pressure of the natural gas, thus stopping the flow of the natural gas from the leak.

\* Graphic is for informational purposes only. Scale and technical detail are not accurate.

## ALISO CANYON SITUATION TIMELINE



SoCalGas will continue to keep the community updated by posting updates and information on our website [socalgas.com](http://socalgas.com) under the title “Aliso Canyon Updates.”

We have also set up a special call-in number (818) 435-7707 and email address, [AlisoCanyon@socalgas.com](mailto:AlisoCanyon@socalgas.com), where customers can contact us.

In addition, we welcome neighbors to stop by our public information booth, open 7 days a week from 10 a.m. to 5 p.m., near the entrance to our facility 12801 Tampa Avenue.

Thank you to our customers and the community for your cooperation, patience and understanding.

ATTACHMENT 2

1 Department of Conservation, Division of Oil, Gas, and Geothermal Resources  
2 Legal Office for the STATE OIL AND GAS SUPERVISOR  
3 801 K Street, MS 24-03  
4 Sacramento, California 95814-3530  
5 Telephone (916) 323-6733  
6 Facsimile (916) 445-9916

7 **STATE OF CALIFORNIA**  
8 **NATURAL RESOURCES AGENCY**  
9 **DEPARTMENT OF CONSERVATION**  
10 **DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES**

11 **EMERGENCY ORDER TO:**  
12 **PROVIDE DATA RE:**  
13 **ALISO CANYON GAS STORAGE FACILITY**

14 [Pub. Resources Code, §§ 3106, 3224, 3226, 3300, and 3403.5.]

15 [Cal. Code Regs., tit. 14, §§ 1724.6, 1724.7, subd. (e), and 1724.10, subs. (a), (h) & (k)]

16  
17 **Emergency Order No. 1104**

18 **November 18, 2015**

19 **Operator: Southern California Gas Company (S4700)**

20 **Aliso Canyon Field**

21 **Los Angeles County**

22  
23 **BY**

24 **Dr. Steven R. Bohlen**

25 **STATE OIL AND GAS SUPERVISOR**

1 **I. Introduction**

2 The State Oil and Gas Supervisor (Supervisor), acting under the authority of the Public  
3 Resources Code (PRC), including PRC section 3224, can order tests and remedial work  
4 concerning oil field operations which, in his judgment, are necessary to prevent damage to life,  
5 health, property, and natural resources. (See Pub. Resources Code, §§ 3106 and 3224.) In  
6 addition, under the PRC, the Supervisor is charged with ensuring that “no damage occurs to the  
7 environment by reason of injection and withdrawal of gas” in underground gas storage facilities.  
8 (Pub. Resources Code, § 3403.5.) To that end, the Supervisor has the authority to request any  
9 data that are pertinent and necessary for the Division of Oil, Gas, and Geothermal Resources  
10 (Division), and its District Deputy, to properly evaluate underground injection projects (See,  
11 e.g., Cal. Code Regs., tit. 14, §§ 1724.6 and 1724.7, subd. (e).) The operator of an injection  
12 project must maintain these data to show, among other things, that no damage to life, health,  
13 property, or natural resources is occurring by reason of the project (Cal. Code Regs., tit. 14, §  
14 1724.10, subd. (h)) and such data must be made available for inspection by Division personnel  
15 (*Ibid.*). Moreover, in an emergency, “the [S]upervisor may order or undertake the actions he or  
16 she deems necessary to protect life, health, property, or natural resources.” (Pub. Resources  
17 Code, § 3226.)

18 At all times relevant to this Order, **Southern California Gas Company**<sup>1</sup> (SoCal Gas or  
19 Operator) is the “operator,” as defined in PRC section 3009, of certain “wells,” as defined in  
20 PRC section 3008, subdivision (a), and is conducting “operations” as defined in California Code  
21 of Regulations, title 14, (Regulations) section 1720, subdivision (f), at a gas storage project (see  
22 Cal. Code Regs., tit. 14, § 1724.9) in the Aliso Canyon Field in Los Angeles County (Field).

23 Based on data in the files of the Division, discussions with operator, and Division site  
24 visits, the Supervisor has determined that that there is an uncontrolled flow of fluids (see  
25 1722.5) from well “Standard Sesnon” 25, and a waste of gas, in the Field that Operator has been,  
26 and is currently, addressing. Operator’s efforts to address the upset have included various tests

27 <sup>1</sup> The Operator Code the Division uses for Southern California Gas Company is S4700.

1 and remedial work. However, the efforts have not yet remedied the uncontrolled flow of fluids  
2 or stop the waste of gas. In addition, Operator has not yet furnished the Division information  
3 about, and results from, some of the tests and/or remedial work. The Supervisor needs  
4 immediate access to these data to monitor and address the uncontrolled flow of fluids, and  
5 current and future remedial work. **Therefore, according to PRC sections 3013, 3106, 3224,**  
6 **3226, 3300, and 3403.5, and Regulations sections 1724.6, 1724.7, subdivision (e), and**  
7 **1724.10, subdivisions (a), (h), and (k), the Supervisor hereby orders Operator to provide**  
8 **the data identified below (Section V; Data Required from Operator).**

## 9 **II. Definitions**

10 The following definitions apply to the terms used in this Order:

11 **PRC section 3008, subdivision (a)**, defines “**Well**” to mean, among other things, “any  
12 well drilled for the purpose of injecting fluids or gas for stimulating oil or gas recovery[.]”

13 **PRC section 3009** defines “**Operator**” to mean “a person who, by virtue of ownership,  
14 or under the authority of a lease or any other agreement, has the right to drill, operate, maintain,  
15 or control a well or production facility.”

16 **Regulations section 1720, subdivision (f)**, defines “**Operations**” to mean “any one or all  
17 of the activities of an operator covered by Division 3 of the Public Resources Code [i.e., the oil  
18 and gas law, commencing with PRC section 3000].”

## 19 **III. Statutory and Related Authority**

20 **PRC section 3013** states that the oil and gas law (Division 3 of the PRC, commencing  
21 with section 3000) “shall be liberally construed to meet its purposes” and grants the Supervisor  
22 “all powers” that may be necessary to carry out those purposes.

23 **PRC section 3106, subdivision (a)**, authorizes the Supervisor to “supervise the drilling,  
24 operation, maintenance, and abandonment of wells and the operation, maintenance, and removal  
25 or abandonment of tanks and facilities attendant to oil and gas production ... so as to prevent, as  
26 far as possible, damage to life, health, property, and natural resources[.]”



1 **Regulations section 1724.10, subdivision (k)**, authorizes the Supervisor to request  
2 additional data requirements or modifications as necessary to fit specific circumstances and  
3 types of projects.

4 **IV. Reasons Why Data Requested is Pertinent and Necessary**

5 Operator's efforts to address the uncontrolled flow of fluids have included various tests and  
6 remedial work. However, the efforts have not yet remedied the uncontrolled flow of fluids nor  
7 stopped the waste of gas. In addition, Operator has not yet furnished the Division with all  
8 information about, and results from, some of the tests and/or remedial work. In order to ensure  
9 that all necessary steps are taken to prevent damage to life, health, property, or natural resources,  
10 the Supervisor needs immediate access to these data to monitor the uncontrolled flow of fluids  
11 and current and planned activities to stop the uncontrolled flow of fluids and waste of gas.

12 **V. Data Required from Operator**

13 Based on the facts, and in accord with the legal authorities, described in this Order, the  
14 Supervisor has determined that he needs immediate access to the below data to monitor and  
15 address the uncontrolled flow of fluids and waste of gas at Operator's gas storage injection  
16 project in the Field. **Therefore, IT IS HEREBY ORDERED, pursuant to PRC sections**  
17 **3013, 3106, 3224, 3226, 3300, and 3403.5, and Regulations sections 1724.6, 1724.7,**  
18 **subdivision (e), and 1724.10, subdivisions (a), (h), and (k), that the Operator:**

19  
20 (A) By 5:00 p.m. Thursday November 19, 2015, provide continuous access to real-  
21 time electronic monitoring of wellhead pressures, and, as requested by the Division, plans  
22 and results of all diagnostic tests and well logs.

23  
24 (B) By 5:00 p.m. Thursday November 19, 2015, submit the following information  
25 obtained between Friday, October 23, 2015, and Wednesday, November 18, 2015:

- 26  
27 1. Downhole videos;

2. Well Logs, including temperature surveys, acoustic logs, neutron logs, cement bond logs, ultra-sonic imager/gamma ray logs, density logs, nuclear fluid density logs;
3. Pressure Surveys;
4. Pressure testing of the casings, tubing, and/or packers; and
5. Spinner Surveys.

(C) By 5:00 p.m. Friday November 20, 2015, submit a time schedule identifying when relief well site preparation will be complete and when drilling of relief well will commence.

Send all data via electronic mail to the Division (Alan Walker and John Geroch) at the following addresses:

[Alan.Walker@conservation.ca.gov](mailto:Alan.Walker@conservation.ca.gov)

[John.Geroch@conservation.ca.gov](mailto:John.Geroch@conservation.ca.gov)

## **VI. Operator's Appeal Rights**

Operator may appeal this Order to the Director of the Department of Conservation by filing a written notice of appeal with the Supervisor as described in PRC section 3350. (The Legal Office for the State Oil and Gas Supervisor [801 K Street, MS 24-03, Sacramento, California 95814-3530; Facsimile (916) 445-9916] will accept appeal notices on the Supervisor's behalf). Because this is an emergency order issued under PRC section 3226, the filing of an appeal of this Order will not operate as a stay of this Order. (PRC, § 3350, subd. (b)(1).) Failing to file a notice of appeal within the timeframe prescribed in PRC section 3350, subdivision (a), waives Operator's right to challenge this Order and makes the Order final. If Operator timely files a notice of appeal, Operator will be informed of the appeal hearing date,

1 time, and place. After the close of the hearing, Operator will receive a written decision that  
2 affirms, sets aside, or modifies the Order.

3 **VII. Court Order and Other Potential Actions to Enforce This Order**

4 Failing to comply with **Section V (Data Required from Operator)** of this Order could  
5 subject Operator to further enforcement action. For example, the Supervisor could deny  
6 approval of proposed well operations until compliance is achieved, order the plugging and  
7 abandonment of wells, and/or assess a civil penalty. (Pub. Resources Code, §§ 3203, subd. (c),  
8 3236.5, and 3237, subd. (a)(3)(C).)

9 Further, PRC section 3236 makes it a misdemeanor to fail, neglect, or refuse to furnish  
10 any report or record that the Supervisor may require under the oil and gas law. The  
11 misdemeanor is punishable by a fine of not less than one hundred dollars (\$100) nor more than  
12 one thousand dollars (\$1,000), or by imprisonment not exceeding six months, or by both the fine  
13 and imprisonment for each separate offense. PRC section 3359 makes it a misdemeanor to fail  
14 or neglect to comply with an order of the Supervisor or to fail, refuse, or neglect to produce  
15 books, papers, or documents as demanded in the order. Each day's further failure, refusal, or  
16 neglect is a separate and distinct offense.

17  
18 DATED: November 18, 2015

19  
20 Dr. Steven R. Bohlen  
21 State Oil and Gas Supervisor

22  
23   
24  
25

26 Certified mail receipt number: 7012 1010 0000 9269 9029

ATTACHMENT 3



NATURAL RESOURCES AGENCY OF CALIFORNIA  
DEPARTMENT OF CONSERVATION  
DIVISION OF OIL, GAS, AND GEOTHERMAL RESOURCES

Rec'd 11-19-15 DOGGR D2 Ventura

FOR DIVISION USE ONLY		
Bond	Forms	
		OGD114

010 / 00 / 30  
45

**NOTICE OF INTENTION TO DRILL NEW WELL**  
Detailed instructions can be found at: [www.conservation.ca.gov/dog/](http://www.conservation.ca.gov/dog/)

In compliance with Section 3203, Division 3, Public Resources Code, notice is hereby given that it is our intention to drill well "Porter" 39A, well type Storage Well, API No. \_\_\_\_\_, (Assigned by Division)  
Sec. 28, T.3N, R. 16W, S.B. B.&M., Aliso Canyon Storage Field, Los Angeles County.

Legal description of mineral-right lease, consisting of N/A acres (attach map or plat to scale), is as follows:

Do mineral and surface leases coincide? Yes  No . If answer is no, attach legal description of both surface and mineral leases, and map or plat to scale.

Location of well \_\_\_\_\_ feet \_\_\_\_\_ along section  / property  line and \_\_\_\_\_ feet \_\_\_\_\_ (Direction) (Check one) (Direction)

at right angles to said line from the \_\_\_\_\_ corner of section  / property  and (Check one)

Lat./Long. in decimal degrees, to six decimal places, NAD 83 format: Latitude: 34.312570 Longitude: -118.560352

If well is to be directionally drilled, show proposed coordinates (from surface location) and true vertical depth at total depth: 950 feet North and 1110 feet West. Estimated true vertical depth 7800. Elevation of ground above sea level 2602 feet. All depth measurements taken from top of Kelly Bushing that is 22.5 feet above ground. (Derrick Floor, Rotary Table, or Kelly Bushing)

Is this a critical well as defined in the California Code of Regulations, Title 14, Section 1720(a) (see next page)? Yes  No

Is a California Environmental Quality Act (CEQA) document required by a local agency? Yes  No  If yes, see next page.

**PROPOSED CASING PROGRAM**

KB 2624.5'

SIZE OF CASING (Inches API)	WEIGHT	GRADE AND TYPE	TOP	BOTTOM	CEMENTING DEPTHS	FORMATION PRESSURE (Estimated Maximum)	CALCULATED FILL BEHIND CASING (Linear Feet)
13-3/8"	54.5#	K-55	Surface	1200'	Surface	Hydrostatic	1200'
9-5/8"	47#	L-80	Surface	7900'	Surface	Hydrostatic	7900'
7"	26#	L-80	7800'	8200'	7800'-8200'	Variable-Storage	400'

(Attach a complete drilling program including wellbore schematics in addition to the above casing program.)

Estimated depth of base of fresh water: N/A Anticipated geological markers: M-P: 8182' (Name, depth)

Intended zone(s) of completion: Sesnon - Storage Zone- Variable Estimated total depth: 8200' MD (Name, depth and expected pressure)

**The Division must be notified immediately of changes to the proposed operations. Failure to provide a true and accurate representation of the well and proposed operations may cause rescission of the permit.**

Name of Operator <u>Southern California Gas Company</u>			
Address <u>12801 Tampa Ave.</u>		City/State <u>Northridge, CA</u>	Zip Code <u>91326-1045</u>
Name of Person Filing Notice <u>Todd Van de Putte</u>	Telephone Number: <u>661-305-5387</u>	Signature 	Date <u>11-19-15</u>
Individual to contact for technical questions: <u>Todd Van de Putte</u>	Telephone Number: <u>661-305-5387</u>	E-Mail Address: <u>tvandeputte@semprautilities.com</u>	

This notice and an indemnity or cash bond shall be filed, and approval given, before drilling begins. If operations have not commenced within one year of the Division's receipt of the notice, this notice will be considered cancelled.

**Southern California Gas Company - Aliso Canyon - Porter 39A**  
**Drilling/Completion Program**

**DATE:** November 17, 2015 revised November 19, 2015

**OBJECTIVE:** Drill and complete a storage/intercept well in the Aliso Canyon Storage Field

**SURFACE LOCATION:**

28 Section, Township 3N, Range 16W, S.B. B&M / GPS Coordinates (NAD 83, Zone 5): 34.312570 North;  
118.560352 West

**API NUMBER:** TBD

**DRILLING RIG:**

Ensign #587 (See attached proposed Rig Equipment List) Note: Drilling rig main power to use two 1500 hp low emission-natural gas fired generators with one diesel generator backup.

**ELEVATIONS:**

Ground Elevation: 2602'

Estimated Rig KB: 22.5'

All depths refer to proposed kelly bushing 22.5' above ground elevation.

**BOTTOM HOLE COORDINATES (Preliminary Directional Plan, Final to be Submitted):**

Bottom Hole Target: 8000' MD, 7800' TVD, 950' North, 1110' West

*Note: Another attempt to run a gyro survey in the Standard Sesnon 25 well will be made. An attempt to run a gyro survey in the Standard Sesnon 25 well was made on 11-10-15 and was unsuccessful due to the wellbore conditions at that time.*

**TOP OF ZONES (Estimated, Measured Depth):**

MP: 8182' MD

**FORMATION FRACTURE GRADIENT (Estimated):** 0.80 psi/ft

**FIELD PRESSURE:** Sesnon Storage Zone: Variable BHP – hydrostatic maximum bottom hole pressure (8.6-9.2 ppg mud planned, adjust mud weight according to actual storage zone pressure to maintain overbalance)

**PROPOSED CASING PROGRAM (See attached wellbore schematic):**

0' – 1200'	13-3/8"	54.5#	K-55, Buttress, Surface casing, cemented to surface.
0' – 7900'	9-5/8"	47.0#	L-80, Hydril 563, Production Casing cemented to surface
7800' - 8200'	7"	26#	L-80, Liner (contingency)

**PROPOSED HOLE SIZES (+/-):**

0' to 1200' -- 17-12" hole  
 1201' to 7900' -- 14" hole.  
 7901' to 8200' -- 8-1/2" hole.

**DIRECTIONAL PROGRAM:***(Final directional plan to follow)*

Drill vertical hole to 2000' MD / 2000' TVD.

Directionally Drill 14" hole from 2001' to 7900'(+/-) MD.

Directionally Drill 8-1/2" hole from 7901' MD to 8200'(+/-) MD.

Estimated Total Measured Depth: 8200'(+/-) MD.

**MUD PROGRAM:**

1. For drilling to the casing shoes at 1200'MD (+/-) and 7900'MD (+/-), use the GEO Drilling Fluids Polytek+ w/3%-6% Potash mud with the following properties:

- a. Weight: 8.8 – 9.6 ppg
- b. Viscosity: 45 – 55 sec. A.P.I.
- c. Yield Point: 15-25 lb/100 sqft.
- d. Fluid loss: 8 - 10 cc/ 30 min. A.P.I.
- e. % solids: 3-7 %
- f. pH: 9.0 – 9.5

Estimated static temperatures: 80 deg F @ 1200'; 150 deg F @ 7000'; 185 deg F @ 8600' MD

**NOTES:**

- Add the equivalent of 3% KCl to inhibit clay swelling while drilling in the producing zones.
- Use sized calcium carbonate as required to control mud losses below the 9-5/8" production casing shoe.
- Solids Control: a Mud cleaner with 150-200 mesh (API) screens and a Centrifuge will be onsite during the drilling operations. Run the Mud Cleaner and the Centrifuge to maintain a high gravity solids content in the mud of less than 4%.
- Mud weights to be adjusted (if possible) based Sesnon zone bottomhole pressure.
- Hydraulics to be based on a 120-160 ft/min annular velocity.

ATTACHMENT 4

Operator	Lease	No.	API No.	Well Status	Well Type	Pool Name
Southern Calif. Gas Co.	Standard Sesnon	29	03700041	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Sesnon Fee	1	03700647	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Sesnon Fee	3	03700649	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	2	03700665	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	4	03700667	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	5	03700668	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	7	03700670	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32	03700686	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	33	03700687	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	14	03700703	Active	Gas Storage	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	14	03700703	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	25R	03700712	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	30	03700717	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32	03700719	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	34	03700721	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	35	03700722	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	36	03700723	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	37	03700724	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	38	03700725	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	39	03700726	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	40	03700727	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	44	03700731	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	46	03700733	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter Sesnon	42	03700753	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	2	03700755	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	3	03700756	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	4	03700757	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	5	03700758	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	6	03700759	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	8	03700761	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	9	03700762	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	11	03700763	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	14	03700766	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	16	03700768	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	25	03700776	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	31	03700781	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	44	03700788	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32B	03721276	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32A	03721277	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	35E	03721278	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	35C	03721279	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32F	03721313	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	26E	03721319	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	26D	03721320	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32E	03721321	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	25A	03721322	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	25B	03721323	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	26C	03721353	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32F	03721354	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32D	03721355	Active	Gas Storage	Sesnon-Frew

Operator	Lease	No.	API No.	Well Status	Well Type	Pool Name
Southern Calif. Gas Co.	Fernando Fee	32D	03721356	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	26B	03721357	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32B	03721358	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32C	03721359	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32C	03721360	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	44B	03721361	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	26A	03721362	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	32E	03721363	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	4A	03721375	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	35D	03721453	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	44A	03721455	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	35A	03721457	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	35B	03721458	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32-A	03721872	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	42A	03721876	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	42B	03721877	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	42C	03721878	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	34-A	03722044	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	37-A	03722046	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69A	03722051	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	4-0	03722063	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	50A	03722737	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	68A	03722742	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69B	03724127	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69C	03724128	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69D	03724130	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	68B	03724136	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69E	03724138	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	24A	03724143	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	24B	03724144	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	72A	03724145	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	72B	03724146	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69H	03724223	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69J	03724224	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69G	03724225	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69F	03724226	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	38A	03724230	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	38B	03724231	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	38C	03724232	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	69K	03724236	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	50B	03724336	Active	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	46A	03724137	Cancelled	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	10	03700040	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Sesnon Fee	8	03700654	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	6	03700669	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	8	03700671	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Frew	9	03700672	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Mission Adrian	3	03700693	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Mission Adrian	4	03700694	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	12	03700701	Idle	Gas Storage	Sesnon-Frew

Operator	Lease	No.	API No.	Well Status	Well Type	Pool Name
Southern Calif. Gas Co.	Porter	26	03700713	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	45	03700732	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	47	03700734	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	1	03700754	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	12	03700764	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	13	03700765	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	17	03700769	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	24	03700775	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	30	03700780	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Mission Adrian	1A	03721891	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Mission Adrian	1B	03721892	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	1-0	03722058	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	34BR	03722302	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Ward	3A	03722306	Idle	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	50C	03724337	New	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32G	03730374	New	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	32H	03730456	New	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	4B	03730460	New	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	39A	03730471	New	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter Fee	1	03700644	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter Fee	2	03700645	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter Fee	3	03700646	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Del Aliso 1	1	03700655	Plugged	Gas Storage	Aliso, West
Southern Calif. Gas Co.	Frew	3	03700666	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	31	03700685	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	34	03700688	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Fernando Fee	35	03700689	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Mission Adrian	5	03700695	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	4	03700699	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	41	03700728	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	41	03700728	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	42	03700729	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Porter	43	03700730	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Standard Sesnon	7	03700760	Plugged	Gas Storage	Sesnon-Frew
Southern Calif. Gas Co.	Mission Adrian	5-A	03722309	Plugged	Gas Storage	Sesnon-Frew
The Termo Co.	Del Aliso 1	4	03700034	Idle	Pressure Maintenance	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Fernando Fee	37	03700011	Active	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	24	03700711	Active	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	33	03700720	Active	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	50	03700735	Active	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Fernando Fee	36	03706293	Active	Water Disposal	Porter-Del Aliso A-36
The Termo Co.	Del Aliso 1	6A	03700659	Idle	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Fernando Fee	30	03700684	Idle	Water Disposal	Porter-Del Aliso A-36
Porter Sesnon et al	Limekiln	1	03700640	Plugged	Water Disposal	No Pool Breakdown
Southern Calif. Gas Co.	Mission-Adrian Fee	1	03700691	Plugged	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Mission-Adrian Fee	2	03700692	Plugged	Water Disposal	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	23	03700710	Active	Water Flood	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	24	03700711	Active	Water Flood	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	50	03700735	Active	Water Flood	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	52	03700737	Active	Water Flood	Aliso

<b>Operator</b>	<b>Lease</b>	<b>No.</b>	<b>API No.</b>	<b>Well Status</b>	<b>Well Type</b>	<b>Pool Name</b>
Southern Calif. Gas Co.	Porter	53	03700738	Active	Water Flood	Aliso
Southern Calif. Gas Co.	Porter	73	03720642	Active	Water Flood	Porter-Del Aliso A-36
Southern Calif. Gas Co.	Porter	19	03700708	Idle	Water Flood	Aliso
Southern Calif. Gas Co.	Porter	22	03700709	Idle	Water Flood	Porter-Del Aliso A-36



<< Back	Production Data	Production Graph	Injection Data	Injection Graph	Export Data	Printer Friendly	
API: 03721354	Oper: Southern Calif. Gas Co.	S4700	Opr Status: A	County: Los Angeles			
Field: Aliso Canyon	010	Lease: Porter	Well#: 32F				
Area: Any Area	00	District: 2	Section: 27	Twn: 3N	Rng: 16W	BM: SB	
Pool: Sesnon-Frew	30	Well Type: GS	Well Status: Active	BIM: <input type="checkbox"/>			
Entry: 4/1/1976	Pool Status: Active						
Date	Stat	Water/Steam	Gas/Air	Pressure	Water Source	WaterKind	
09/2015	00	0	218,438	26	2706	0	0
08/2015	00	0	199,306	19	2639	0	0
07/2015	00	0	194,414	24	2602	0	0
06/2015	00	0	132,426	24	2592	0	0
05/2015	00	0	279,648	30	2587	0	0
04/2015	00	0	371,204	30	2383	0	0
03/2015	00	0	183,575	21	2134	0	0
02/2015	06	0	0	0	0	0	0
01/2015	06	0	0	0	0	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,579,011</b>	<b>174</b>			
12/2014	00	0	32,397	8	2618	0	0
11/2014	00	0	30,348	6	2720	0	0
10/2014	00	0	48,418	4	2666	0	0
09/2014	06	0	0	0	0	0	0
08/2014	06	0	0	0	0	0	0
07/2014	06	0	0	0	0	0	0
06/2014	06	0	0	0	0	0	0
05/2014	06	0	0	0	0	0	0
04/2014	06	0	0	0	0	0	0
03/2014	06	0	0	0	0	0	0
02/2014	06	0	0	0	0	0	0
01/2014	06	0	0	0	0	0	0
<b>Total 2014</b>		<b>0</b>	<b>111,163</b>	<b>18</b>			
12/2013	06	0	0	0	0	0	0
11/2013	06	0	0	0	0	0	0
10/2013	06	0	0	0	0	0	0
09/2013	06	0	0	0	0	0	0
08/2013	06	0	0	0	0	0	0
07/2013	06	0	0	0	0	0	0
06/2013	06	0	0	0	0	0	0
05/2013	00	0	294,373	20	0	0	0
04/2013	00	0	209,964	22	0	0	0
03/2013	00	0	73,851	12	0	0	0
02/2013	00	0	39,343	7	0	0	0
01/2013	06	0	0	0	0	0	0
<b>Total 2013</b>		<b>0</b>	<b>617,531</b>	<b>61</b>			
12/2012	00	0	53,637	14	0	0	0
11/2012	00	0	66,553	25	0	0	0
10/2012	00	0	332,356	29	0	0	0
09/2012	00	0	152,767	17	0	0	0
08/2012	00	0	93,906	12	0	0	0
07/2012	00	0	172,250	15	0	0	0
06/2012	00	0	395,238	30	0	0	0
05/2012	00	0	126,625	7	0	0	0
04/2012	06	0	0	0	0	0	0
03/2012	00	0	232,871	15	0	0	0
02/2012	00	0	50,530	15	0	0	0
01/2012	00	0	85,591	15	0	0	0
<b>Total 2012</b>		<b>0</b>	<b>1,762,324</b>	<b>194</b>			
12/2011	00	0	14,649	2	0	0	0
11/2011	00	0	115,416	23	0	0	0

≤ Back	Production Data	Production Graph	Injection Data	Injection Graph	Export Data	Printer Friendly
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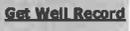
**API:** 
**Oper:** 

**Opr Status:** 
**County:** 
 Help

**Field:** 

**Lease:** 
**Well#:** 
 Get Well Map

**Area:** 

**District:** 
**Section:** 
**Twn:** 
**Rng:** 
**EM:** 
 Get Well Record

**Pool:** 

**Well Type:** 
**Well Status:** 
**BLM:**

**Entry:** 
**Pool Status:**

Date	Stat	Water/Steam	Gas/Air	Days	Pressure	Water Source	WaterKind
09/2015	00	0	223,680	26	2696	0	0
08/2015	00	0	100,301	9	2630	0	0
07/2015	06	0	0	0	0	0	0
06/2015	00	0	131,275	20	2600	0	0
05/2015	00	0	305,071	30	2555	0	0
04/2015	00	0	404,949	30	2399	0	0
03/2015	00	0	199,330	20	2146	0	0
02/2015	06	0	0	0	0	0	0
01/2015	00	0	3,004	1	2309	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,367,610</b>	<b>136</b>			
12/2014	00	0	14,301	3	2619	0	0
11/2014	00	0	23,779	5	2721	0	0
10/2014	00	0	257,287	23	2646	0	0
09/2014	06	0	0	0	0	0	0
08/2014	06	0	0	0	0	0	0
07/2014	00	0	331,234	29	2222	0	0
06/2014	00	0	462,834	30	2096	0	0
05/2014	00	0	493,852	31	1886	0	0
04/2014	00	0	548,352	26	1462	0	0
03/2014	00	0	142,679	18		0	0
02/2014	06	0	0	0		0	0
01/2014	06	0	0	0		0	0
<b>Total 2014</b>		<b>0</b>	<b>2,274,318</b>				
12/2013	06	0	0	0		0	0
11/2013	00	0	13,269	7		0	0
10/2013	00	0	100,689	18		0	0
09/2013	00	0	238,802	21		0	0
08/2013	00	0	138,012	20		0	0
07/2013	00	0	197,045	26		0	0
06/2013	00	0	373,177	27		0	0
05/2013	00	0	546,257	31		0	0
04/2013	00	0	107,530	10		0	0
03/2013	06	0	0	0		0	0
02/2013	00	0	9,915	3		0	0
01/2013	00	0	19,829	3		0	0
<b>Total 2013</b>		<b>0</b>	<b>1,744,525</b>				
12/2012	00	0	64,831	16		0	0
11/2012	00	0	69,181	24		0	0
10/2012	00	0	160,749	14		0	0
09/2012	06	0	0	0		0	0
08/2012	00	0	85,966	8		0	0
07/2012	00	0	187,909	15		0	0
06/2012	00	0	417,840	29		0	0
05/2012	06	0	0	0		0	0
04/2012	06	0	0	0		0	0
03/2012	00	0	56,604	3		0	0
02/2012	00	0	12,282	3		0	0
01/2012	06	0	0	0		0	0
<b>Total 2012</b>		<b>0</b>	<b>1,055,362</b>	<b>112</b>			
12/2011	06	0	0	0		0	0
11/2011	06	0	0	0		0	0

Back	Production Data	Production Graph	Injection Data	Injection Graph	Export Data	Printer Friendly
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API:  Oper:  S4700 Opr Status:  County:

Field:   Lease:  Well#:

Area:   District:  Section:  Twn:  Rng:  BM:

Pool:   Well Type:  Well Status:  BLM:

Entry:  Pool Status:

Date	Stat	Water/Steam	Gas/Air	Days	Pressure	Water Source	WaterKind
09/2015	00	0	276,812	26	2680	0	0
08/2015	00	0	117,025	9	2631	0	0
07/2015	06	0	0	0	0	0	0
06/2015	00	0	123,542	16	2581	0	0
05/2015	00	0	355,916	30	2581	0	0
04/2015	00	0	472,441	30	2377	0	0
03/2015	00	0	232,552	20	2138	0	0
02/2015	06	0	0	0	0	0	0
01/2015	00	0	21,777	4	2304	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,600,065</b>				
12/2014	00	0	16,684	3	2609	0	0
11/2014	00	0	27,754	5	2718	0	0
10/2014	00	0	300,168	23	2649	0	0
09/2014	06	0	0	0	0	0	0
08/2014	06	0	0	0	0	0	0
07/2014	00	0	386,454	29	2234	0	0
06/2014	00	0	539,973	30	2092	0	0
05/2014	00	0	445,675	25	1881	0	0
04/2014	00	0	494,557	21	1461	0	0
03/2014	00	0	6,919	2		0	0
02/2014	06	0	0	0		0	0
01/2014	06	0	0	0		0	0
<b>Total 2014</b>		<b>0</b>	<b>2,218,184</b>				
12/2013	06	0	0	0		0	0
11/2013	00	0	15,480	7		0	0
10/2013	00	0	4,883	2		0	0
09/2013	06	0	0	0		0	0
08/2013	06	0	0	0		0	0
07/2013	06	0	0	0		0	0
06/2013	06	0	0	0		0	0
05/2013	06	0	0	0		0	0
04/2013	06	0	0	0		0	0
03/2013	06	0	0	0		0	0
02/2013	00	0	11,544	3		0	0
01/2013	00	0	23,134	3		0	0
<b>Total 2013</b>		<b>0</b>	<b>55,041</b>				
12/2012	00	0	75,646	16		0	0
11/2012	00	0	80,711	24		0	0
10/2012	00	0	352,706	25		0	0
09/2012	00	0	211,950	22		0	0
08/2012	00	0	100,537	9		0	0
07/2012	00	0	219,227	15		0	0
06/2012	00	0	487,457	29		0	0
05/2012	06	0	0	0		0	0
04/2012	06	0	0	0		0	0
03/2012	00	0	66,038	3		0	0
02/2012	00	0	14,329	3		0	0
01/2012	06	0	0	0		0	0
<b>Total 2012</b>		<b>0</b>	<b>1,608,601</b>	<b>146</b>			
12/2011	06	0	0	0		0	0
11/2011	00	0	49,875	6		0	0

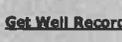
<a href="#">&lt;&lt; Back</a>	Production Data	Production Graph	Injection Data	Injection Graph	Export Data	Printer Friendly	
API: 03721878	Oper: Southern Calif. Gas Co.	S4700	Opr Status: A	County: Los Angeles			
Field: Aliso Canyon	010	Lease: Porter	Well#: 42C	<a href="#">Get Well Map</a>			
Area: Any Area	00	District: 2	Section: 28	Twn: 3N	Rng: 16W	EM: SB	
Pool: Sesnon-Frew	30	Well Type: GS	Well Status: Active	BLM:	<a href="#">Get Well Record</a>		
Entry: 3/1/1979	Pool Status: Active						
Date	Stat	Water/Steam	Gas/Air	Pressure	Water Source	WaterKind	
09/2015	00	0	257,650	26	2710	0	0
08/2015	00	0	35,464	3	2660	0	0
07/2015	06	0	0	0	0	0	0
06/2015	00	0	1,084	1	2610	0	0
05/2015	00	0	271,781	24	2615	0	0
04/2015	00	0	438,695	30	2390	0	0
03/2015	00	0	210,083	20	2120	0	0
02/2015	06	0	0	0	0	0	0
01/2015	06	0	0	0	0	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,214,757</b>	<b>104</b>			
12/2014	06	0	0	0	0	0	0
11/2014	00	0	16,195	3	2686	0	0
10/2014	00	0	107,362	9	2970	0	0
09/2014	06	0	0	0	0	0	0
08/2014	06	0	0	0	0	0	0
07/2014	06	0	0	0	0	0	0
06/2014	06	0	0	0	0	0	0
05/2014	00	0	334,207	20	1835	0	0
04/2014	00	0	134,848	6	1440	0	0
03/2014	06	0	0	0	0	0	0
02/2014	06	0	0	0	0	0	0
01/2014	06	0	0	0	0	0	0
<b>Total 2014</b>		<b>0</b>	<b>592,612</b>				
12/2013	06	0	0	0	0	0	0
11/2013	06	0	0	0	0	0	0
10/2013	06	0	0	0	0	0	0
09/2013	00	0	90,495	10	0	0	0
08/2013	00	0	149,382	20	0	0	0
07/2013	00	0	213,443	26	0	0	0
06/2013	00	0	404,276	27	0	0	0
05/2013	00	0	33,167	2	0	0	0
04/2013	06	0	0	0	0	0	0
03/2013	06	0	0	0	0	0	0
02/2013	06	0	0	0	0	0	0
01/2013	00	0	20,920	4	0	0	0
<b>Total 2013</b>		<b>0</b>	<b>911,683</b>	<b>89</b>			
12/2012	06	0	0	0	0	0	0
11/2012	06	0	0	0	0	0	0
10/2012	06	0	0	0	0	0	0
09/2012	06	0	0	0	0	0	0
08/2012	00	0	65,138	8	0	0	0
07/2012	00	0	203,566	15	0	0	0
06/2012	00	0	472,171	30	0	0	0
05/2012	00	0	566,831	28	0	0	0
04/2012	00	0	424,902	21	0	0	0
03/2012	06	0	0	0	0	0	0
02/2012	06	0	0	0	0	0	0
01/2012	00	0	16,881	2	0	0	0
<b>Total 2012</b>		<b>0</b>	<b>1,749,489</b>	<b>104</b>			
12/2011	00	0	17,303	2	0	0	0
11/2011	00	0	136,074	23	0	0	0

≤ Back	Production Data	Production Graph	Injection Data	Injection Graph	Export Data	Printer Friendly	
API: 03724138	Oper: Southern Calif. Gas Co.	\$4700	Opr Status: A	County: Los Angeles			
Field: Aliso Canyon	010	Lease: Porter	Well#: 69B				
Area: Any Area	00	District: 2	Section: 28	Twn: 3N	Rng: 16W	EM: SB	
Pool: Sesnon-Frew	30	Well Type: GS	Well Status: Active	BLM:			
Entry: 7/1/1993	Pool Status: Active						
Date	Stat	Water/Steam	Gas/Air	Days	Pressure	Water Source	WaterKind
09/2015	00	0	237,827	26	2662	0	0
08/2015	00	0	217,229	19	2599	0	0
07/2015	00	0	218,203	24	2577	0	0
06/2015	00	0	142,578	24	2560	0	0
05/2015	00	0	305,071	30	2525	0	0
04/2015	00	0	404,949	30	2336	0	0
03/2015	00	0	235,841	26	2118	0	0
02/2015	08	0	0	0	0	0	0
01/2015	08	0	0	0	0	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,761,698</b>				
12/2014	08	0	0	0	0	0	0
11/2014	00	0	14,950	3	2709	0	0
10/2014	00	0	322,948	27	2628	0	0
09/2014	00	0	411,248	25	2551	0	0
08/2014	00	0	473,486	26	2393	0	0
07/2014	00	0	346,862	30	2289	0	0
06/2014	00	0	462,834	30	2053	0	0
05/2014	00	0	502,872	31	1868	0	0
04/2014	00	0	619,263	29	1449	0	0
03/2014	00	0	144,343	18		0	0
02/2014	08	0	0	0		0	0
01/2014	08	0	0	0		0	0
<b>Total 2014</b>		<b>0</b>	<b>3,298,806</b>				
12/2013	00	0	9,940	2		0	0
11/2013	00	0	13,888	7		0	0
10/2013	00	0	101,863	18		0	0
09/2013	00	0	113,632	9		0	0
08/2013	00	0	138,015	20		0	0
07/2013	00	0	197,011	26		0	0
06/2013	00	0	373,177	27		0	0
05/2013	00	0	546,257	31		0	0
04/2013	00	0	228,931	22		0	0
03/2013	00	0	38,352	6		0	0
02/2013	00	0	84,056	12		0	0
01/2013	08	0	0	0		0	0
<b>Total 2013</b>		<b>0</b>	<b>1,845,122</b>	<b>180</b>			
12/2012	00	0	50,601	13		0	0
11/2012	00	0	70,347	24		0	0
10/2012	00	0	160,749	14		0	0
09/2012	08	0	0	0		0	0
08/2012	00	0	72,289	8		0	0
07/2012	00	0	187,909	15		0	0
06/2012	00	0	444,318	30		0	0
05/2012	00	0	523,229	28		0	0
04/2012	00	0	461,507	26		0	0
03/2012	00	0	233,968	13		0	0
02/2012	00	0	50,768	13		0	0
01/2012	00	0	59,035	9		0	0
<b>Total 2012</b>		<b>0</b>	<b>2,314,720</b>				
12/2011	00	0	75,766	7		0	0
11/2011	00	0	122,655	23		0	0

<b>&lt;&lt; Back</b>	<b>Production Data</b>	<b>Production Graph</b>	<b>Injection Data</b>	<b>Injection Graph</b>	<b>Export Data</b>	<b>Printer Friendly</b>
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API:  Oper:   Opr Status:  County:   Help

Field:   Lease:  Well#:   Get Well Map

Area:   District:  Section:  Twn:  Rng:  BM:   Get Well Record

Pool:   Well Type:  Well Status:  BIM:

Entry:  Pool Status:

Date	Stat	Water/Steam	Gas/Air	Days	Pressure	Water Source	WaterKind
09/2015	00	0	277,464	26	2705	0	0
08/2015	00	0	107,766	10	2632	0	0
07/2015	00	0	247,543	24	2604	0	0
06/2015	00	0	164,318	22	2592	0	0
05/2015	00	0	355,916	30	2590	0	0
04/2015	00	0	472,441	30	2367	0	0
03/2015	00	0	233,641	21	2132	0	0
02/2015	06	0	0	0	0	0	0
01/2015	06	0	0	0	0	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,859,089</b>				
12/2014	06	0	0	0	0	0	0
11/2014	06	0	0	0	0	0	0
10/2014	06	0	0	0	0	0	0
09/2014	06	0	0	0	0	0	0
08/2014	06	0	0	0	0	0	0
07/2014	06	0	0	0	0	0	0
06/2014	06	0	0	0	0	0	0
05/2014	00	0	535,530	28	1781	0	0
04/2014	00	0	686,496	27	1462	0	0
03/2014	00	0	155,484	18		0	0
02/2014	06	0	0	0		0	0
01/2014	06	0	0	0		0	0
<b>Total 2014</b>		<b>0</b>	<b>1,377,510</b>				
12/2013	00	0	12,692	8		0	0
11/2013	00	0	17,102	8		0	0
10/2013	00	0	109,726	18		0	0
09/2013	00	0	52,175	6		0	0
08/2013	00	0	161,017	20		0	0
07/2013	00	0	229,901	26		0	0
06/2013	00	0	435,374	27		0	0
05/2013	00	0	637,300	31		0	0
04/2013	00	0	165,552	13		0	0
03/2013	00	0	457	1		0	0
02/2013	06	0	0	0		0	0
01/2013	06	0	0	0		0	0
<b>Total 2013</b>		<b>0</b>	<b>1,821,296</b>	<b>158</b>			
12/2012	06	0	0	0		0	0
11/2012	00	0	82,072	24		0	0
10/2012	00	0	422,639	29		0	0
09/2012	00	0	197,060	20		0	0
08/2012	00	0	107,507	11		0	0
07/2012	00	0	108,069	9		0	0
06/2012	06	0	0	0		0	0
05/2012	06	0	0	0		0	0
04/2012	06	0	0	0		0	0
03/2012	00	0	45,241	4		0	0
02/2012	00	0	9,817	4		0	0
01/2012	00	0	60,134	9		0	0
<b>Total 2012</b>		<b>0</b>	<b>1,032,539</b>	<b>110</b>			
12/2011	06	0	0	0		0	0
11/2011	00	0	146,866	23		0	0

Production Data	Production Graph	Injection Data	Injection Graph	Export Data	Printer Friendly
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**API:** 03724146    **Oper:** Southern Calif. Gas Co.    S4700    **Opr Status:** A    **County:** Los Angeles    **Help**

**Field:** Aliso Canyon    010    **Lease:** Porter    **Well#:** 72B    **Get Well Map**

**Area:** Any Area    00    **District:** 2    **Section:** 27    **TwN:** 3N    **Rng:** 16W    **EM:** SB    **Get Well Record**

**Pool:** Sesnon-Frew    30    **Well Type:** GS    **Well Status:** Active    **BLM:**

**Entry:** 7/1/1993    **Pool Status:** Active

Date	Stat	Water/Steam	Gas/Air	Days	Pressure	Water Source	WaterKind
09/2015	00	0	218,008	26	2714	0	0
08/2015	00	0	84,684	10	2632	0	0
07/2015	00	0	194,485	24	2610	0	0
06/2015	00	0	129,100	22	2605	0	0
05/2015	00	0	279,648	30	2578	0	0
04/2015	00	0	371,204	30	2386	0	0
03/2015	00	0	183,575	21	2138	0	0
02/2015	06	0	0	0	0	0	0
01/2015	06	0	0	0	0	0	0
<b>Total 2015</b>		<b>0</b>	<b>1,460,704</b>	<b>163</b>			
12/2014	06	0	0	0	0	0	0
11/2014	06	0	0	0	0	0	0
10/2014	06	0	0	0	0	0	0
09/2014	06	0	0	0	0	0	0
08/2014	06	0	0	0	0	0	0
07/2014	06	0	0	0	0	0	0
06/2014	06	0	0	0	0	0	0
05/2014	00	0	420,767	28	1791	0	0
04/2014	00	0	539,390	27	1435	0	0
03/2014	00	0	122,171	18		0	0
02/2014	06	0	0	0		0	0
01/2014	06	0	0	0		0	0
<b>Total 2014</b>		<b>0</b>	<b>1,082,328</b>	<b>73</b>			
12/2013	00	0	9,453	4		0	0
11/2013	00	0	13,437	8		0	0
10/2013	00	0	86,216	18		0	0
09/2013	00	0	36,636	5		0	0
08/2013	06	0	0	0		0	0
07/2013	06	0	0	0		0	0
06/2013	06	0	0	0		0	0
05/2013	06	0	0	0		0	0
04/2013	06	0	0	0		0	0
03/2013	06	0	0	0		0	0
02/2013	06	0	0	0		0	0
01/2013	06	0	0	0		0	0
<b>Total 2013</b>		<b>0</b>	<b>145,742</b>	<b>35</b>			
12/2012	06	0	0	0		0	0
11/2012	06	0	0	0		0	0
10/2012	06	0	0	0		0	0
09/2012	00	0	95,742	12		0	0
08/2012	00	0	84,583	11		0	0
07/2012	00	0	84,911	9		0	0
06/2012	06	0	0	0		0	0
05/2012	06	0	0	0		0	0
04/2012	06	0	0	0		0	0
03/2012	00	0	35,573	4		0	0
02/2012	00	0	7,719	4		0	0
01/2012	00	0	47,248	9		0	0
<b>Total 2012</b>		<b>0</b>	<b>355,776</b>				
12/2011	06	0	0	0		0	0
11/2011	00	0	115,395	23		0	0

<a href="#">&lt;&lt; Back</a>	<a href="#">Production Data</a>	<a href="#">Production Graph</a>	<a href="#">Injection Data</a>	<a href="#">Injection Graph</a>	<a href="#">Export Data</a>	<a href="#">Printer Friendly</a>
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API:  Oper:   Opr Status:  County:  

Field:   Lease:  Well#:  

Area:   District:  Section:  Twn:  Rng:  BM:  

Pool:   Well Type:  Well Status:  BLM:

Entry:  Pool Status:

Date	Stat	Water/Steam	Gas/Air	Pressure	Water Source	WaterKind
09/2015	00	0	215,360	25	2712	0
08/2015	00	0	217,199	19	2656	0
07/2015	00	0	218,290	24	2622	0
06/2015	00	0	140,716	22	2606	0
05/2015	00	0	305,071	30	2615	0
04/2015	00	0	404,949	30	2402	0
03/2015	00	0	199,330	20	2171	0
02/2015	00	0	74,058	17	2160	0
01/2015	00	0	31,091	8	2265	0
<b>Total 2015</b>		<b>0</b>	<b>1,806,064</b>			
12/2014	00	0	14,301	3	2631	0
11/2014	00	0	23,789	5	2740	0
10/2014	00	0	202,154	18	2696	0
09/2014	00	0	323,555	23	2603	0
08/2014	00	0	502,349	28	2526	0
07/2014	00	0	331,337	29	2263	0
06/2014	00	0	462,834	30	2110	0
05/2014	00	0	502,836	31	1900	0
04/2014	00	0	567,269	27	1469	0
03/2014	00	0	119,531	15		0
02/2014	06	0	0	0		0
01/2014	06	0	0	0		0
<b>Total 2014</b>		<b>0</b>	<b>3,049,955</b>			
12/2013	06	0	0	0		0
11/2013	00	0	772	1		0
10/2013	00	0	84,353	15		0
09/2013	00	0	238,802	21		0
08/2013	00	0	138,015	20		0
07/2013	00	0	196,951	26		0
06/2013	00	0	373,177	27		0
05/2013	00	0	546,257	31		0
04/2013	00	0	229,020	22		0
03/2013	00	0	34,518	4		0
02/2013	06	0	0	0		0
01/2013	00	0	15,656	2		0
<b>Total 2013</b>		<b>0</b>	<b>1,857,521</b>			
12/2012	00	0	54,435	12		0
11/2012	00	0	72,609	25		0
10/2012	00	0	216,448	19		0
09/2012	06	0	0	0		0
08/2012	06	0	0	0		0
07/2012	06	0	0	0		0
06/2012	06	0	0	0		0
05/2012	06	0	0	0		0
04/2012	06	0	0	0		0
03/2012	00	0	40,207	2		0
02/2012	00	0	8,724	2		0
01/2012	06	0	0	0		0
<b>Total 2012</b>		<b>0</b>	<b>392,423</b>	<b>60</b>		
12/2011	06	0	0	0		0
11/2011	00	0	69,385	13		0

ATTACHMENT 6

4. Each PAL must contain a list of all the wells (injectors, producers, idle and plugged wells etc.) associated with the project.
5. Every project formation fracture gradient must be based on a SRT conducted on the project's injection zone(s). Also, the date of the test must be specified on the PAL. A PAL for multiple injection zones, must identify the fracture gradient for each zone.

## **B. Area of Review Evaluations**

As of December 2013, there were 268 injection projects listed in District 1, of which 154 were active projects. A review of a sample of District 1 injection projects was conducted to confirm whether appropriate and complete AORs had been submitted by the operator and reviewed by the Division. The MC Unit Review Team selected 45 injection projects for evaluation. UIC project files and well files were reviewed to gather data for this evaluation. This sample group comprised various project statuses (40 active, 4 terminated, and 1 rescinded project), from fields discovered in the 1930s and 1940s. The selected projects included a variety of project approval dates and project types, including water flood (WF), water disposal (WD), and gas storage (GS).

Of the 45 projects used as a sample population for this review of AOR use, 24 projects were permitted pre-Primacy (pre-March 1983), and 21 projects were permitted post-Primacy. Of the 24 pre-Primacy projects, 20 projects were permitted before, and four after, the 1978 regulations (CCR Title 14, section 1724, February 17, 1978). Of the 21 post-Primacy projects, 16 projects were permitted before, and five after, the 2010 UIC Letter of Expectations.

**Tables 2 and 3** respectively, present the pre- and post-Primacy injection project findings summaries for the sample group reviewed. Tabulated data includes: project status, initial project approval date, whether an AOR was completed, number of "bad" wells identified, and comments regarding how identified potential zonal conduits were addressed.

An overview of the criteria required for evaluation of the appropriateness and completeness of an AOR is presented within **Appendix B** of this report. As detailed in the appendix, the presence, or lack of supporting AOR-essential criteria within a project or well file was used to determine whether the required project review *could have been* completed. For example, it is highly unlikely that an AOR could have been completed without casing diagrams. Casing diagrams submitted with injection project applications are critical in determining zonal isolation within the AOR. Casing diagrams are therefore a crucial application component that, when missing, suggests that an AOR could not have been conducted.

When an AOR is delineated, the casing diagrams of the wells (including open-hole wellbores) within the AOR are closely evaluated as potential conduits for fluid migration outside the intended zone of injection. For the purposes of this review, wells evaluated are classified as

“good,” “bad,” or “gray.” Wells are classified as “good” when they meet current standards of zonal isolation. Those wells identified as direct or partial conduits due to poor, inadequate or lack of cement, or mechanical problems, are classified as “bad” wells subject to remediation prior to commencement of any injection. A third category of wells referred to as “gray” wells do not fit into either of the first two categories. Gray wells were either completed and/or abandoned to the standard existing at the time of their drilling, but are not now cemented to the current standard as required by CCR section 1722.4 (Cementing casing); or do not meet the specific plugging and abandonment or annular cement lengths required by CCR, Chapter 4, Article 3, Sections 1723.1 (a) (Plugging of Oil or Gas Zones) and 1723.2 (Plugging for Freshwater Protection), Section 1723.1(b); 1723.1 (c) (4) (open hole plugging and abandonment).

### *Determinations*

**Tables 2 and 3** present findings summaries of the 45 projects evaluated. **Figures 1 through 4**, present illustrated analyses of the AOR evaluation findings discussed below.

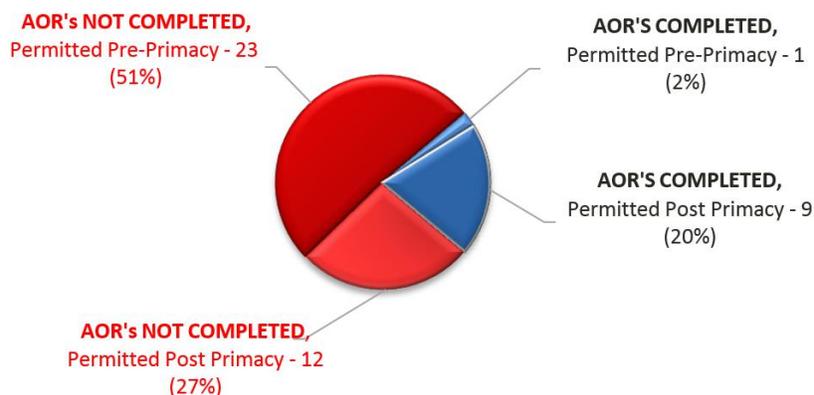
#### District 1 - Pre-Primacy Projects Review

Only 1 of the 24 approved pre-Primacy injection project files evaluated contained sufficient AOR-essential criteria to support a complete AOR. Although these projects were approved (including the 2 terminated and 1 rescinded projects-see **Table 2**) pre-Primacy, all of the projects remained active post-Primacy and in conformance with Primacy requirements, should have been reviewed, updated, and issued a modified PAL.

**Figure 1** on the following page provides an illustration of the number and percentages of AORs, completed (blue) and not completed (red) for projects sampled from the pre-Primacy and post-Primacy time periods.

Common deficiencies in pre-Primacy AOR project file evaluations include: missing well lists, missing well casing diagrams, casing diagrams with insufficient data such as the location of the top of the injection zone(s) (TIZ), cement information, specific USDW depths, or reference to a USDW, and well histories with inconsistent information.

## Appropriate AOR'S Completed Pre- and Post-Primacy



**Figure 1:** Appropriate AOR's completed Pre- and Post-Primacy (total 45 selected projects). AOR's not completed (78%) are shaded red and AOR's completed (22%) are shaded blue. All but one of the completed AORs was completed during the post-Primacy period.

### District 1 – Post-Primacy Projects Review

A representative sample of 21 approved post-Primacy projects were reviewed for the presence of appropriately delineated and complete AOR evaluations, and to determine if potential conduits for injection fluid were present. Nine of the 21 projects were appropriately delineated and had complete AOR evaluations; 12 projects did not. A total of 154 bad wells were identified by District 1 post-Primacy AOR evaluations. These results are presented in **Table 3**, which gives a project code number (PC no.) for each project evaluated.

Highlights of the **Table 3** results were as follows:

1. Two approved injection project reviews indicated that no bad wells were identified by District AOR evaluations. (PC nos. 78206011 and 84903013.)
2. Two AOR evaluations identified a significant number of bad wells still under additional review by the Division as of December 2014. (PC nos. 32400015 and 32400016.)
3. Two AOR evaluations identified bad wells that were remediated as a condition of a letter or PAL. (PC nos. 84939009 and 32018003.)
4. Three AOR evaluations identified bad wells to be addressed by implementing a monitoring program. (PC nos. 66600007, 84918008 and 47806002.)
5. Graphical data for two of the projects with monitoring programs was not submitted to the

Division in accordance with a stated condition of the PAL. (PC nos. 66600007 and 47806002.)

6. Applicant operator submitted incomplete AOR data to the Division. In one instance, out of 57 wells in the one-quarter mile AOR, only 7 casing diagrams were submitted for review. A review of the casing diagrams shows inadequate casing information; moreover, there was no information on the diagrams locating the top of injection zone. (PC no. 66600008.)
7. For the 12 post-Primacy projects identified in this review as having incomplete AOR evaluations, the data suggest that the District did not identify or address them. For each of these 12 projects, AORs should have been completed during the initial project application evaluation before the issuance of a PAL especially considering these projects were permitted under the post-Primacy agreement. Annually thereafter, these projects could have been brought up to standard during the APR but were not.
8. Nine of the 21 project applications approved post-Primacy had appropriate AOR evaluations completed. Eight of the nine applications were approved between 2005 - 2013. This demonstrates an improvement in AOR completions for new applications.
9. Many project files failed to contain maps of the directional path of the wells within the AOR completely, or at all. Prior to 2010, AORs did not include the directional path of wells in the area surrounding the proposed injection wells to determine the AOR boundary. Consequently, a complete or accurate list of wells within the AOR was not available.
10. Records were frequently insufficient to determine if problem wells found in the AOR evaluation were remediated prior to commencing injection.

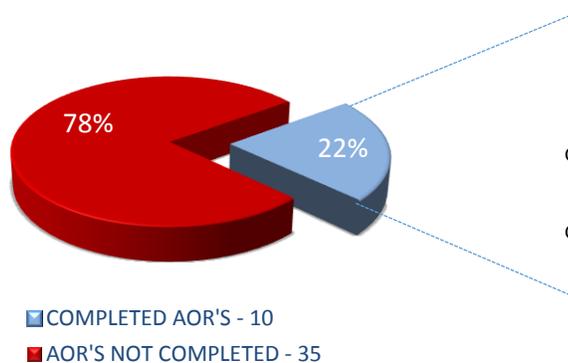
#### **Other Determinations Concerning Post-Primacy Projects:**

11. Following direction from upper Division management in 2012, District 1 no longer required use of the term “remediation” in permit language regarding “bad” wells (potential injection fluid conduits) identified during AOR evaluations. The approved PAL terminology was changed from “remediate” to “address.” It is unclear whether this terminology change was intended to mean remediation, or merely monitoring. From 2009 to 2012 there was an increase in the number of applications for new or extension of existing injection projects. This surge of applications, together with the number of incomplete applications in the queue awaiting required data, resulted in delays of project approvals. In 2012, to expedite the injection project evaluation and approval process, a new Division policy was established that allowed operators to add injection wells (new wells or well conversions) within existing injection project boundaries, without comprehensive AOR reviews. This “deferral” policy was initiated based on the premise that AOR evaluations would be performed later, during the APR process, and that the subject fields had previously been through the AOR evaluation process.

12. A review of 159 projects for APR compliance found that 5 projects had APR within the last 5 years, 135 had no evidence of an APR conducted within the last 5 years (some as long as 20 years), and 19 had no APR conducted. Evidence suggests reliance on a questionnaire submitted by operators was used as an APR. For a more in-depth analysis, refer to **Table 10**, in the annual project review section of this report.

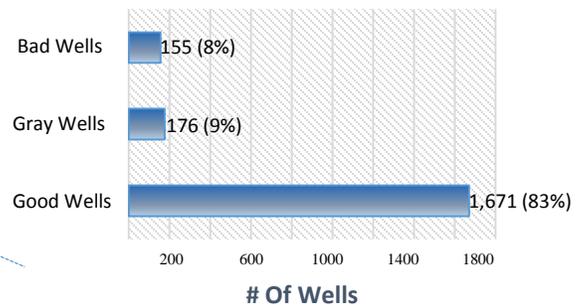
**Figures 2 and 3** below illustrate the results of the reviewed injection project evaluations and breakdown of well status percentages within the 10 completed injection projects identified both pre-Primacy (1 project) and post-Primacy (9 projects).

**Overview of Pre-Primacy and Post-Primacy Injection Projects Evaluated for AOR Completion**



**Figure 2:** Overview of Pre-Primacy and Post-Primacy Injection Projects Evaluated for AOR Completion. An AOR evaluation should have been completed for each of the 45 selected projects.

**Breakdown of Wells Reviewed**



Note: A total of 2,002 wells from 10 AORs were evaluated

**Figure 3:** Breakdown of Wells Reviewed (from the 10 completed AORs) showing the numbers and sample population percentages of the good, gray, and bad wells identified from the District 1 review of the 10 completed AORs.

**Seven In-Depth AOR Evaluations Conducted During This Review:**

Based on the finding that 35 out of the 45 pre- and post-Primacy projects reviewed had no AOR evaluations, the MC Unit selected a subset of 7 project files from this group to perform its own in-depth AOR evaluations. The MC Unit Review Team identified and listed the wells in each AOR, reviewing individual well histories and evaluating casing diagrams.

*Determinations*

These focused evaluations led to the following determinations:

1. A total of 230 well casing diagrams from the 7 injection projects were reviewed for zonal isolation. The review indicated that 37 wells (16%) were “bad”, 69 wells

ATTACHMENT 7

<b>&lt;&lt; Back</b>	<b>Injection Data</b>	<b>Injection Graph</b>	<b>Export Data</b>	<b>Printer Friendly</b>
API: <input type="text" value="03700011"/>	Oper: <input type="text" value="Southern Calif. Gas Co."/>	<input type="text" value="54700"/>	Opr Status: <input type="text" value="A"/>	County: <input type="text" value="Los Angeles"/>
Field: <input type="text" value="Aliso Canyon"/>	<input type="text" value="010"/>	Lease: <input type="text" value="Fernando Fee"/>	Well#: <input type="text" value="37"/>	<a href="#">Get Well Map</a>
Area: <input type="text" value="Any Area"/>	<input type="text" value="00"/>	District: <input type="text" value="2"/>	Section: <input type="text" value="27"/>	Twn: <input type="text" value="3N"/> Rng: <input type="text" value="16W"/> BM: <input type="text" value="SB"/>
Pool: <input type="text" value="Porter-Del Aliso A-36"/>	<input type="text" value="15"/>	Well Type: <input type="text" value="WD"/>	Well Status: <input type="text" value="Active"/>	BLM: <input type="text" value=""/>
Entry: <input type="text" value="4/1/1976"/>	Pool Status: <input type="text" value="Active"/>			

Date	Time	Water/Steam	Gas/Air	Pressure	Water Source	WaterKind
09/2015	00	59,813	0	30	0	1
08/2015	00	77,055	0	31	0	1
07/2015	00	80,416	0	31	1500	1
06/2015	00	68,896	0	30	0	1
05/2015	00	71,334	0	31	0	1
04/2015	00	64,686	0	30	0	1
03/2015	00	74,879	0	31	0	0
02/2015	00	56,980	0	28	0	0
01/2015	00	77,276	0	31	0	0
<b>Total 2015</b>		<b>631,335</b>	<b>0</b>	<b>273</b>		
12/2014	00	83,916	0	31	0	0
11/2014	00	65,072	0	29	910	0
10/2014	00	72,690	0	31	0	0
09/2014	00	74,795	0	30	0	0
08/2014	00	81,589	0	31	0	0
07/2014	00	84,423	0	31	0	0
06/2014	00	78,846	0	30	0	0
05/2014	00	113,799	0	31	0	0
04/2014	00	61,552	0	28	0	0
03/2014	00	92,810	0	29	0	0
02/2014	00	81,372	0	28	0	0
01/2014	00	54,085	0	25	0	0
<b>Total 2014</b>		<b>944,949</b>	<b>0</b>			
12/2013	00	54,369	0	30	0	0
11/2013	00	57,789	0	29	0	0
10/2013	00	52,787	0	28	0	0
09/2013	00	55,453	0	29	0	0
08/2013	00	57,733	0	31	0	0
07/2013	00	56,540	0	27	0	0
06/2013	00	44,706	0	27	0	0
05/2013	00	1,558	0	30	0	0
04/2013	00	1,312	0	30	0	0
03/2013	00	766	0	23	0	0
02/2013	00	41	0	1	0	0
01/2013	00	1,253	0	30	0	0
<b>Total 2013</b>		<b>384,307</b>	<b>0</b>			
12/2012	00	1,381	0	31	0	0
11/2012	00	1,403	0	30	0	0
10/2012	00	7,170	0	9	0	0
09/2012	06	0	0	0	0	0
08/2012	06	0	0	0	0	0
07/2012	06	0	0	0	0	0
06/2012	00	4	0	1	1	1
05/2012	06	0	0	0	0	0
04/2012	00	30,706	0	25	0	0
03/2012	00	45,541	0	29	0	0
02/2012	00	38,547	0	29	0	0
01/2012	00	26,482	0	23	0	0
<b>Total 2012</b>		<b>151,234</b>	<b>0</b>	<b>177</b>		
12/2011	06	0	0	0	0	0
11/2011	00	16,947	0	20	0	0

<b>&lt;&lt; Back</b>	<b>Injection Data</b>	<b>Injection Graph</b>	<b>Export Data</b>	<b>Printer Friendly</b>
API: 03700710	Oper: Southern Calif. Gas Co.	S4700	Opr Status: A	County: Los Angeles
Field: Aliso Canyon	010	Lease: Porter	Well#: 23	
Area: Any Area	00	District: 2	Section: 27	Twn: 3N Rng: 16W EM: SB
Pool: Porter-Del Aliso A-36	15	Well Type: WF	Well Status: Active	BLM: <input type="checkbox"/>
Entry: 4/1/1976	Pool Status: Active			

Date	Stat	Water/Steam	Gas/Air		Pressure	Water Source	WaterKind
09/2015	00	1,252	0	29	0	1	1
08/2015	00	2,169	0	31	0	1	1
07/2015	00	1,209	0	31	1200	1	1
06/2015	00	2,170	0	30	0	1	1
05/2015	00	1,974	0	31	0	1	1
04/2015	00	1,259	0	30	0	1	1
03/2015	00	1,473	0	31	0	1	1
02/2015	00	649	0	28	0	1	1
01/2015	00	1,051	0	31	0	1	1
<b>Total 2015</b>		<b>13,206</b>	<b>0</b>	<b>272</b>			
12/2014	00	2,506	0	31	0	1	1
11/2014	00	1,439	0	29	1100	1	1
10/2014	00	1,332	0	31	0	1	1
09/2014	00	1,543	0	30	0	1	1
08/2014	00	2,478	0	31	0	1	1
07/2014	00	2,510	0	31	0	1	1
06/2014	00	2,191	0	30	0	1	1
05/2014	00	5,988	0	31	0	1	1
04/2014	00	3,810	0	28	0	1	1
03/2014	00	2,625	0	31		1	1
02/2014	00	1,282	0	28		1	1
01/2014	00	1,243	0	28		1	1
<b>Total 2014</b>		<b>28,947</b>	<b>0</b>				
12/2013	00	1,890	0	30		1	1
11/2013	00	3,018	0	30		1	1
10/2013	00	2,297	0	28		1	1
09/2013	00	2,637	0	30		1	1
08/2013	00	1,267	0	31		1	1
07/2013	00	4,473	0	31		1	1
06/2013	00	6,622	0	30		1	1
05/2013	00	4,077	0	30		1	1
04/2013	00	2,257	0	30		1	1
03/2013	00	962	0	18		1	1
02/2013	08	0	0	0		1	1
01/2013	00	166	0	3		1	1
<b>Total 2013</b>		<b>29,666</b>	<b>0</b>				
12/2012	00	818	0	22		1	1
11/2012	00	1,581	0	30		1	1
10/2012	00	1,221	0	28		1	1
09/2012	00	1,685	0	29		1	1
08/2012	00	994	0	31		1	1
07/2012	00	1,822	0	31		1	1
06/2012	00	1,173	0	29		1	1
05/2012	00	838	0	31		1	1
04/2012	00	1,864	0	29		1	1
03/2012	00	452	0	29		1	1
02/2012	00	1,875	0	29		1	1
01/2012	00	783	0	29		1	1
<b>Total 2012</b>		<b>15,106</b>	<b>0</b>	<b>347</b>			
12/2011	00	1,076	0	28		1	1
11/2011	00	1,853	0	30		1	1

<a href="#">&lt;&lt; Back</a>	<b>Injection Data</b>	<b>Injection Graph</b>	<b>Export Data</b>	<b>Printer Friendly</b>
API: <input type="text" value="03700711"/>	Oper: <input type="text" value="Southern Calif. Gas Co."/>	<input type="text" value="S4700"/>	Opr Status: <input type="text" value="A"/>	County: <input type="text" value="Los Angeles"/>
Field: <input type="text" value="Aliso Canyon"/>	<input type="text" value="010"/>	Lease: <input type="text" value="Porter"/>	Well#: <input type="text" value="24"/>	
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Pool: <input type="text" value="Porter-Del Aliso A-36"/>	<input type="text" value="15"/>	Well Type: <input type="text" value="WF"/>	Well Status: <input type="text" value="Active"/>	BLM: <input type="text"/>
Entry: <input type="text" value="4/1/1976"/>	Pool Status: <input type="text" value="Active"/>			



Date	Stat	Water/Steam	Gas/Air	Pressure	Water Source	WaterKind
09/2015	06	0	0	0	1	1
08/2015	00	1,706	0	3	1	1
07/2015	00	1,180	0	8	1	1
06/2015	00	15,372	0	20	1	1
05/2015	00	20,955	0	31	1	1
04/2015	00	21,988	0	30	1	1
03/2015	00	26,652	0	31	1	1
02/2015	00	12,987	0	28	1	1
01/2015	00	24,171	0	31	1	1
<b>Total 2015</b>		<b>125,011</b>	<b>0</b>	<b>182</b>		
12/2014	00	33,519	0	31	1	1
11/2014	00	21,808	0	29	1	1
10/2014	00	24,015	0	31	1	1
09/2014	00	28,983	0	30	1	1
08/2014	00	32,308	0	31	1	1
07/2014	00	34,714	0	31	1	1
06/2014	00	30,074	0	30	1	1
05/2014	00	51,874	0	31	1	1
04/2014	00	27,278	0	26	1	1
03/2014	00	35,432	0	30	1	1
02/2014	00	22,894	0	28	1	1
01/2014	00	23,243	0	24	1	1
<b>Total 2014</b>		<b>366,142</b>	<b>0</b>			
12/2013	00	33,830	0	30	1	1
11/2013	00	39,632	0	30	1	1
10/2013	00	34,868	0	27	1	1
09/2013	00	34,380	0	30	1	1
08/2013	00	32,728	0	31	1	1
07/2013	00	12,901	0	11	1	1
06/2013	00	1	0	1	1	1
05/2013	00	14,807	0	16	1	1
04/2013	00	25,023	0	30	1	1
03/2013	00	18,838	0	30	1	1
02/2013	00	487	0	27	1	1
01/2013	00	32,100	0	31	1	1
<b>Total 2013</b>		<b>279,595</b>	<b>0</b>	<b>294</b>		
12/2012	00	33,684	0	31	1	1
11/2012	00	31,744	0	30	1	1
10/2012	00	25,971	0	28	1	1
09/2012	00	29,892	0	30	1	1
08/2012	00	19,096	0	31	1	1
07/2012	00	35,174	0	31	1	1
06/2012	00	25,053	0	29	1	1
05/2012	00	28,280	0	31	1	1
04/2012	00	28,359	0	30	1	1
03/2012	00	15,278	0	28	1	1
02/2012	00	32,194	0	28	1	1
01/2012	00	31,033	0	29	1	1
<b>Total 2012</b>		<b>335,758</b>	<b>0</b>			
12/2011	00	33,271	0	29	1	1
11/2011	00	27,802	0	29	1	1

<b>&lt;&lt; Back</b>	<b>Injection Data</b>	<b>Injection Graph</b>	<b>Export Data</b>	<b>Printer Friendly</b>
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Pool: <input type="text" value="Aliso"/>	<input type="text" value="05"/>	Well Type: <input type="text" value="WF"/>	Well Status: <input type="text" value="Active"/>	BIM: <input type="text" value=""/>
Entry: <input type="text" value="4/1/1976"/>	Pool Status: <input type="text" value="Active"/>			

Date	Stat	Water/Steam	Gas/Air		Pressure	Water Source	WaterKind
09/2015	00	498	0	30	0	0	0
08/2015	00	1,654	0	31	0	1	1
07/2015	00	1,545	0	13	1100	0	0
06/2015	00	681	0	6	0	1	1
05/2015	06	0	0	0	0	0	0
04/2015	06	0	0	0	0	0	0
03/2015	06	0	0	0	0	1	1
02/2015	06	0	0	0	0	1	1
01/2015	06	0	0	0	0	1	1
<b>Total 2015</b>		<b>4,378</b>	<b>0</b>				
12/2014	00	55	0	2	0	1	1
11/2014	06	0	0	0	0	1	1
10/2014	06	0	0	0	0	1	1
09/2014	06	0	0	0	0	1	1
08/2014	06	0	0	0	0	1	1
07/2014	00	186	0	22	0	1	1
06/2014	00	568	0	29	0	1	1
05/2014	00	4,238	0	28	0	1	1
04/2014	00	803	0	25	0	1	1
03/2014	00	627	0	30		1	1
02/2014	00	373	0	28		1	1
01/2014	00	1,966	0	26		1	1
<b>Total 2014</b>		<b>8,816</b>	<b>0</b>				
12/2013	00	433	0	30		1	1
11/2013	00	1,858	0	30		1	1
10/2013	00	628	0	28		1	1
09/2013	00	3,075	0	29		1	1
08/2013	00	3,529	0	29		1	1
07/2013	00	14,041	0	31		1	1
06/2013	00	314	0	30		1	1
05/2013	00	393	0	30		1	1
04/2013	00	288	0	29		1	1
03/2013	00	1,205	0	26		1	1
02/2013	00	248	0	28		1	1
01/2013	00	145	0	30		1	1
<b>Total 2013</b>		<b>26,157</b>	<b>0</b>				
12/2012	00	215	0	30		1	1
11/2012	00	158	0	30		1	1
10/2012	00	1,945	0	28		1	1
09/2012	00	262	0	28		1	1
08/2012	00	632	0	31		1	1
07/2012	00	349	0	31		1	1
06/2012	00	556	0	28		1	1
05/2012	00	3,237	0	29		1	1
04/2012	00	4,439	0	13		1	1
03/2012	06	0	0	0		1	1
02/2012	06	0	0	0		1	1
01/2012	06	0	0	0		1	1
<b>Total 2012</b>		<b>11,793</b>	<b>0</b>				
12/2011	06	0	0	0		1	1
11/2011	06	0	0	0		1	1

<b>&lt;&lt; Back</b>	<b>Injection Data</b>	<b>Injection Graph</b>	<b>Export Data</b>	<b>Printer Friendly</b>
API: <input type="text" value="03700738"/>	Oper: <input type="text" value="Southern Calif. Gas Co."/>	<input type="text" value="S4700"/>	Opr Status: <input type="text" value="A"/>	County: <input type="text" value="Los Angeles"/>
Field: <input type="text" value="Aliso Canyon"/>	<input type="text" value="010"/>	Lease: <input type="text" value="Porter"/>	Well#: <input type="text" value="53"/>	
Area: <input type="text" value="Any Area"/>	<input type="text" value="00"/>	District: <input type="text" value="2"/>	Section: <input type="text" value="27"/>	Twn: <input type="text" value="3N"/> Rng: <input type="text" value="16W"/> BM: <input type="text" value="SB"/>
Pool: <input type="text" value="Aliso"/>	<input type="text" value="05"/>	Well Type: <input type="text" value="WF"/>	Well Status: <input type="text" value="Active"/>	BLM: <input type="text" value=""/>
Entry: <input type="text" value="4/1/1976"/>	Pool Status: <input type="text" value="Active"/>			

Date	Stat	Water/Steam	Gas/Air	Days	Pressure	Water Source	WaterKind
09/2015	00	120	0	4	0	1	1
08/2015	00	171	0	14	0	1	1
07/2015	06	0	0	0	0	1	1
06/2015	00	1,303	0	22	0	1	1
05/2015	00	1,930	0	31	0	1	1
04/2015	00	1,388	0	30	0	1	1
03/2015	00	1,667	0	31	0	1	1
02/2015	00	991	0	28	0	1	1
01/2015	00	938	0	21	0	1	1
<b>Total 2015</b>		<b>8,508</b>	<b>0</b>	<b>181</b>			
12/2014	00	1,224	0	19	0	1	1
11/2014	00	2,016	0	29	1050	1	1
10/2014	00	1,926	0	31	0	1	1
09/2014	00	2,148	0	30	0	1	1
08/2014	00	2,715	0	31	0	1	1
07/2014	00	3,490	0	31	0	1	1
06/2014	00	3,915	0	18	1500	1	1
05/2014	00	571	0	5	1500	1	1
04/2014	00	5,656	0	27	0	1	1
03/2014	00	9,155	0	31		1	1
02/2014	00	19,961	0	21		1	1
01/2014	00	8,460	0	7		1	1
<b>Total 2014</b>		<b>61,237</b>	<b>0</b>	<b>280</b>			
12/2013	00	36,515	0	27		1	1
11/2013	00	5,775	0	23		1	1
10/2013	00	8,067	0	28		1	1
09/2013	00	17,336	0	30		1	1
08/2013	00	29,759	0	31		1	1
07/2013	00	44,490	0	31		1	1
06/2013	00	16,772	0	19		1	1
05/2013	06	0	0	0		1	1
04/2013	06	0	0	0		1	1
03/2013	06	0	0	0		1	1
02/2013	06	0	0	0		1	1
01/2013	06	0	0	0		1	1
<b>Total 2013</b>		<b>158,714</b>	<b>0</b>	<b>189</b>			
12/2012	06	0	0	0		1	1
11/2012	00	12,325	0	29		1	1
10/2012	00	12,575	0	28		1	1
09/2012	00	13,807	0	30		1	1
08/2012	00	9,378	0	31		1	1
07/2012	00	17,167	0	31		1	1
06/2012	00	7,273	0	30		1	1
05/2012	00	10,380	0	31		1	1
04/2012	00	5,511	0	3		1	1
03/2012	00	5	0	31		1	1
02/2012	06	0	0	0		1	1
01/2012	06	0	0	0		1	1
<b>Total 2012</b>		<b>88,421</b>	<b>0</b>	<b>244</b>			
12/2011	06	0	0	0		1	1
11/2011	06	0	0	0		0	0

<a href="#">&lt;&lt; Back</a>	<a href="#">Injection Data</a>	<a href="#">Injection Graph</a>	<a href="#">Export Data</a>	<a href="#">Printer Friendly</a>
API: <input type="text" value="03706293"/>	Oper: <input type="text" value="Southern Calif. Gas Co."/>	<input type="text" value="S4700"/>	Opr Status: <input type="text" value="A"/>	County: <input type="text" value="Los Angeles"/>
Field: <input type="text" value="Aliso Canyon"/>	<input type="text" value="010"/>	Lease: <input type="text" value="Fernando Fee"/>	Well#: <input type="text" value="36"/>	<a href="#">Get Well Map</a>
Area: <input type="text" value="Any Area"/>	<input type="text" value="00"/>	District: <input type="text" value="2"/>	Section: <input type="text" value="27"/>	Twn: <input type="text" value="3N"/>
		Rng: <input type="text" value="16W"/>	BM: <input type="text" value="SB"/>	<a href="#">Get Well Record</a>
Pool: <input type="text" value="Porter-Del Aliso A-36"/>	<input type="text" value="15"/>	Well Type: <input type="text" value="WD"/>	Well Status: <input type="text" value="Active"/>	BLM: <input type="text"/>
Entry: <input type="text" value="4/1/1976"/>	Pool Status: <input type="text" value="Active"/>			

Date	Stat	Water/Steam	Gas/Air	Pressure	Water Source	WaterKind
09/2015	00	32,698	0	30	0	1
08/2015	00	46,278	0	31	0	1
07/2015	00	37,556	0	29	900	1
06/2015	00	41,738	0	29	0	1
05/2015	00	40,411	0	31	0	1
04/2015	00	41,251	0	30	0	1
03/2015	00	47,668	0	31	0	0
02/2015	00	32,869	0	28	0	0
01/2015	00	45,882	0	31	0	0
<b>Total 2015</b>		<b>366,351</b>	<b>0</b>			
12/2014	00	47,339	0	26	0	0
11/2014	00	43,664	0	29	860	0
10/2014	00	46,514	0	31	0	0
09/2014	00	51,874	0	30	0	0
08/2014	00	18,340	0	30	0	0
07/2014	00	43,787	0	28	0	0
06/2014	00	41,706	0	26	0	0
05/2014	00	2	0	2	0	0
04/2014	08	0	0	0	0	0
03/2014	00	1	0	1	0	0
02/2014	00	24,507	0	20	0	0
01/2014	00	25,237	0	27	0	0
<b>Total 2014</b>		<b>342,971</b>	<b>0</b>			
12/2013	00	18,038	0	30	0	0
11/2013	00	17,930	0	30	0	0
10/2013	00	17,223	0	27	0	0
09/2013	00	17,482	0	30	0	0
08/2013	00	19,611	0	31	0	0
07/2013	00	21,375	0	31	0	0
06/2013	00	31,174	0	29	0	0
05/2013	00	24,997	0	29	0	0
04/2013	00	19,887	0	29	0	0
03/2013	00	19,354	0	30	0	0
02/2013	00	50,214	0	28	0	0
01/2013	00	23,554	0	31	0	0
<b>Total 2013</b>		<b>280,839</b>	<b>0</b>			
12/2012	00	21,916	0	31	0	0
11/2012	00	23,397	0	30	0	0
10/2012	00	28,692	0	30	0	0
09/2012	00	43,307	0	30	0	0
08/2012	00	27,522	0	31	1	1
07/2012	00	56,385	0	31	1	1
06/2012	00	38,267	0	29	1	1
05/2012	00	3,883	0	9	0	0
04/2012	00	23,718	0	30	0	0
03/2012	00	25,685	0	28	0	0
02/2012	00	17,863	0	28	0	0
01/2012	00	20,278	0	29	0	0
<b>Total 2012</b>		<b>330,913</b>	<b>0</b>			
12/2011	00	31,785	0	28	0	0
11/2011	00	24,499	0	30	0	0

ATTACHMENT 8

or subzone, at least one geologic cross section through at least one injection well in the project area, e-logs, characteristics of the cap rock.

*If the adequacy of the confining system is in question, what options are considered to compensate for this uncertainty and how are they evaluated?* The Associate O&G Engineer reviews the project, looking at all the wells in the AOR— and all the submitted data, and if there is uncertainty, the Associate will contact the operator to discuss and to obtain possibly more information which may consist of further testing or remedial work by the operator. It is important to note that if uncertainty remains, we would not approve the project.

*Describe the monitoring system requirements for flow rate, cumulative volumes, tubing pressure, annulus pressure, etc. for a Class II injection well.* DOGGR receives production/injection information on a monthly basis from the operator. On an annual basis, each well is visited to perform an environmental inspection to evaluate environmental compliance and pressure monitoring purposes. At that time the pressures are taken from the gauges at the wellhead and compared to the approved MASP. Also, during the MIT testing; flow, pressure and facilities are checked. All the observed data is compared to reported data to ensure operator is complying with project approval, P reports and other requirements.

*Does this monitoring and reporting include observation or measurement of annulus pressures?* The operator is not required to report annulus pressures unless a MI failure is evident from monitoring annulus pressure during operations. The well must be shut in pending repairs if that is the case. DOGGR inspects the annulus pressure during annual MIT surveys. The casing valve is open during RAT surveys, which will reveal excessive pressure on the annulus.

*How are the maximum injection pressures and rates established? Please provide examples of step rate tests conducted and other data used for this purpose.* Due to known stratigraphy and subsurface condition in District 6, a standard 0.8 psi/foot gradient is used to calculate MASP. We use a gradient of 0.465 for salt water – subtract from 0.8 and multiply by the depth of the top perforation. We don't consider friction loss in our determination. Step rate tests are required if the operator wants to possibly inject at a higher pressure than the MASP and need to prove to DOGGR that they will not be going over fracture gradient.

When a step rate test is performed the operator starts from hydrostatic to the pressure required to fracture the injection zone or the proposed injection pressure, whichever occurs first.

*Please elaborate on how the standard 0.8 gradient was established for wells throughout District 6. Is it based on step-rate tests or other pressure data, or on other calculations?* The 0.8 psi/foot gradient has been a statewide/central valley standard. In my experience with the Bakersfield District (1975-2003), step rate tests conducted for water disposal projects were in line with the 0.8 psi/foot gradient. We have had one new water disposal project approved during my one-year tenure with this district. The step rate test conducted for this project determined a fracture gradient of 0.6 psi/foot. The project is completed into the Hamilton & McCormick zones, in Maine Prairie gas field, with perforated intervals between 5,300' -5,700'. The operator should have no difficulty injecting anticipated water volumes at the MASP based upon 0.6 psi/foot.



# Aliso Canyon Natural Gas Leak

## Preliminary Estimate of Greenhouse Gas Emissions to Date (As of November 20, 2015)

On October 23, Southern California Gas informed the State of a natural gas leak at its Aliso Canyon natural gas storage facility. This document provides a preliminary estimate of the amount of methane released since then through today, November 20.

Natural Gas is composed primarily of methane (approximately 80%), which is a potent greenhouse gas. Methane is in a category of greenhouse gases known as short-lived climate pollutants. These types of gases remain in the atmosphere for a much shorter period of time than longer-lived climate pollutants, such as carbon dioxide (CO<sub>2</sub>); but when measured in terms of how they heat the atmosphere, their impacts can be tens, hundreds, or even thousands of times greater than that of carbon dioxide. The global warming impact from methane is 25 times and 72 times that of CO<sub>2</sub>, for equal amounts by weight, over a 100 year and 20 year timespan, respectively. Due to methane's powerful impact and short life compared to other gases it represents an important element in reducing the near-term effects of global warming.

In order to quantify the methane release rate from the Aliso Canyon gas leak, state agencies in collaboration with the research community are collecting measurements near the ground at the well site, and from towers, airplanes and satellites. These varied measurements can be used to calculate an instantaneous emission rate, which in turn will assist with estimating the total methane emissions associated with the leak.

One such type of measurement was made by Scientific Aviation on November 7 and 10 using a small airplane capable of measuring methane and ethane. Ethane uniquely identifies methane from a fossil fuel source and enables separating the methane plume from the Aliso Canyon from that of a nearby landfill. By flying through the downwind methane plume at several elevations, a methane flux can be calculated.

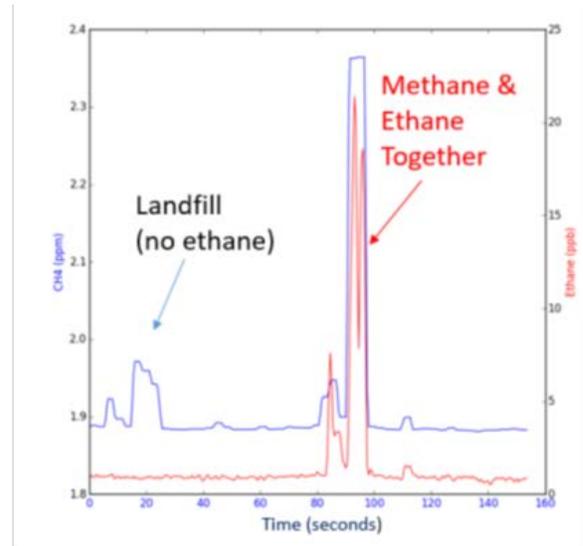


Figure 1 – Left panel shows the view from the plane of the site, marked with the red arrow. Right panel shows the methane and ethane enhancement when flying through the plume downwind of the site.

Data captured on November 7 and 10 from these airplane readings indicates an emission rate during these periods of approximately 44,000±5,000 kilograms of methane per hour and 50,000±16,000 kilograms of methane per hour, respectively. If the release of methane has been constant at these estimated rates since October 23 and through today November 20th, the Aliso Canyon gas leak would have generated about 0.80 million metric tons of carbon dioxide equivalent (MMTCO<sub>2</sub>e) to date. This figure uses a 100-year global warming potential of 25 for methane in order to equate the methane impact with carbon dioxide over a hundred-year period.

To put the preliminary estimate into context, Figure 2 shows the preliminary estimate of the gas leak’s methane release next to the total estimated methane emissions across California during the same time, from October 23<sup>rd</sup> through November 20<sup>th</sup>, by scaling to 28 days the state’s existing inventories of methane release. It suggests that the Aliso Canyon gas leak would have added approximately one-quarter to the regular statewide methane emissions from October 23 to November 20. The relative magnitude of emissions from the leak compared to other sources of methane in the State underscores the urgency of stopping the gas leak. This comes on top of problems caused by odor and any potential impacts from exposure.

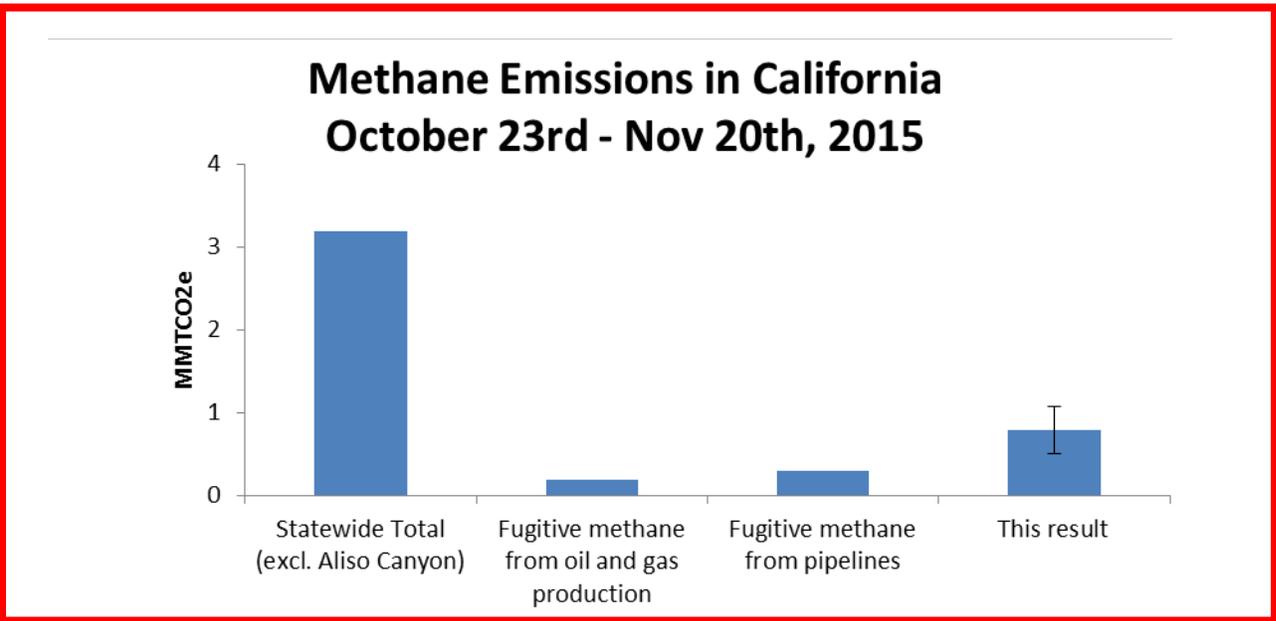


Figure 2. Methane emissions in California since the detection of the Aliso Canyon leak, October 23<sup>rd</sup> through November 20<sup>th</sup> 2015. Major assumptions about leak rate variability have been made in the construction of this graph.

It is important to note that this estimate is preliminary, based on a small number of measurements, and assumes a constant emission rate. In reality, that rate is likely variable. The emission rate of methane at the Aliso Canyon is *not* expected to be constant, as Southern California Gas continues to implement a range of strategies intended to stop the leak.

This preliminary estimate will be refined using additional measurements from towers, satellite overflights, remote sensing and other data sources. Scientific Aviation will likely make additional flights as well to measure emissions from the facility. A complete calculation of the total methane emitted from Aliso Canyon based on a full set of data and an assessment of any changes in methane release rate over the duration of the leak will take several months to complete. This refined estimate will be based on continuous measurements of methane made at multiple stationary sites throughout the Los Angeles basin that have been in place for several years and whose measurements span the entire episode. These data will be used in conjunction with computer simulation models to make a refined estimate of the total methane emitted.

The result should also be considered in the context of the recently released Short-Lived Climate Pollutant Reduction Strategy concept paper, in which the state lays out a goal to reduce emissions of methane in the state by 40% from current levels by 2030. Oil and gas production, along with natural gas distribution, is a significant source of methane emissions and regulatory efforts are under way to reduce emissions from those sectors.

For more information, contact David Clegern: (916)322-8286, [dclegern@arb.ca.gov](mailto:dclegern@arb.ca.gov)