Methane Task Force Inspection Report for the Shafter/Wasco Community

I. Executive Summary

The Methane Task Force (MTF), a collaborative initiative led by the California Air Resources Board (CARB) and the California Department of Conservation's Geologic Energy Management Division (CalGEM), is dedicated to identifying and responding to methane leaks from oil and gas infrastructure near communities. It also aims to address the significant impact that methane has on climate change. This task force was established in response to Governor Newsom's request, outlined in a letter to CARB Chair Liane Randolph in July 2022, and officially formed in October 2022. The MTF regularly convenes public meetings to provide the public with updates on the ongoing efforts of CalGEM and CARB in mitigating methane leaks from oil and gas infrastructure. Additionally, it strives to promote greater public and local agency involvement in these programs and efforts. The MTF consists of representatives from CARB, CalGEM, California Natural Resources Agency (CNRA), and California Environmental Protection Agency (CalEPA).[1] The MTF collaborates closely with air districts, community members, and local governments. To date, the MTF has held or attended the following public and steering committee meetings.

- The September 2022 meeting discussed CARB's Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities, also known as the Oil and Gas Regulation (COGR)[2], upcoming satellite data, CARB enforcement, and an overview of CalGEM's programs.
- The October 2022 meeting provided a review of the feedback received from the first meeting, Bakersfield well updates, a deeper dive into orphan wells, and a discussion on Senate Bill (SB) 1137.
- The February 2023 MTF meeting covered CalGEM's orphan well program screening methodology, an overview of the CARB satellite monitoring partnership, and an update on CARB's proposed amendments to COGR.
- The June 12, 2023, steering committee meeting provided and overview of efforts underway aimed at addressing leaks from oil and gas wells and the MTF received community input on proposed joint inspections in Shafter.
- The June 27, 2023, meeting included an update on the COGR amendments and the Arvin/Lamont inspection findings.
- The August 14, 2023, steering committee meeting provided an overview of the authority of the different MTF agencies, the MTF Shafter community well inspection, the community notification plan, and the sampling plan.

[1] https://www.conservation.ca.gov/calgem/Pages/Methane-Task-Force.aspx
[2] https://ww2.arb.ca.gov/sites/default/files/2020-03/2017%20Final%20Reg%20Orders%20GHG%20Emission%20Standards.pdf

- The October 17, 2023, MTF meeting provided an update on the Shafter inspection findings and provided information on upcoming fugitive emission studies of oil and gas wells.

More information, including presentations, can be found on the Methane Task Force web page.

In May 2023, the MTF partnered with the San Joaquin Valley Air Pollution Control District (SJVAPCD) to conduct joint inspections focused on oil and gas wells in the Arvin/Lamont area. The MTF prepared a summary of inspection results in the MTF Report.[3] In September 2023, the MTF again partnered with SJVAPCD to inspect wells in the Shafter area. This report provides an overview of the Shafter joint inspection effort.

II. Community Engagement

A. Well Selection

The joint inspections conducted by MTF and SJVAPCD were informed in part by engagement with the Shafter Community Steering Committee (CSC). The selection of Shafter represented an opportunity to engage with an Assembly Bill (AB) 617 community that identified oil wells as a top air quality priority. AB 617 communities represent some of the most pollution-burdened communities in the State of California. On June 12, 2023, the MTF engaged with the CSC to provide an overview of key efforts underway aimed at addressing leaks from oil and gas wells and to receive feedback on a proposed inspection plan. On August 14, 2023, the MTF further engaged with the CSC to seek additional suggestions on the proposed inspection plan. Figure 1 displays a picture of the 73 wells selected for this inspection effort. These wells included wells located within 3,200 feet of the Shafter community boundary and critical wells within a 7-mile radius from center of Shafter. These wells were selected for inspection with community input.

B. Plans for Sampling and Analysis

During the meetings with the Shafter community on June 12, 2023, the MTF heard the community's request to understand what co-pollutants are leaking from wells and to be notified of potential safety risks associated with leaking wells. In response to these concerns, the MTF developed comprehensive plans for sampling and analysis of co-pollutants from leaking wells, and for community notification of safety risks. These plans were presented at the August 14, 2023, meeting with the CSC.

- Plan for gas canister sampling and analysis - The sampling plan provides a methodology to collect gas canister samples based on the concentration of methane measured during the well-site inspections. The plan was developed to provide point source gas speciation when methane was detectable above background levels at

[3] https://community.valleyair.org/media/idcjcyg2/final_methane-task-force-arvin-lamont-inspection-report.pdf

three or more feet from the leak source. For wells where methane is detectable above background levels, three feet from the well, a gas sample would be collected and analyzed. The proposed analysis is limited to determining whether elevated levels of compounds were detected at levels that exceeded acute Reference Exposure Levels (RELs)[4] at the point where a sample was collected using the United States Environmental Protection Agency (USEPA) Method Toxic Organics-15 (TO-15). The sampling and analysis plan does not provide for cancer risk analysis, whether compounds were detected at levels exceeding chronic REL, or modeling to investigate short or long-term health effects attributable to leaks detected at the wells.

Shafter sampling and analysis results – MTF did not detect methane concentrations above background levels beyond three feet from the inspected wells and therefore no samples were taken. The MTF is continuing to evaluate the sampling and analysis plan in response to community concerns.

C. Community Notification

- Pre-inspection coordination with local emergency personnel - The MTF coordinated with local first responders, Kern County Fire Department (Kern County Fire) and the Kern County Public Health Services Department, as part of the inspection planning process to determine when emergency personnel would expect to be notified about leaking oil wells. Kern County Fire and the California Governor's Office of Emergency Services would be notified by the MTF if methane is detected at or above 5,000 PPM at a distance of three or more feet from the leak when there is a residence, business, or school fenceline within 300 feet of the well, or when methane is detected at or above 40,000 PPM three or more feet from the leak in any surroundings, and the leak cannot be repaired on the day the methane reading was made. The MTF determined it would defer to local emergency personnel on whether there are any safety risks associated with the aforementioned leaks, and what follow-up actions would be needed, including notification to the local community. Leaks discovered during the inspection did not meet the leak thresholds established in the community notification plan, therefore emergency personnel did not need to be notified.
- Timely and transparent inspection results - The MTF committed to providing near real-time inspection information by publicly posting daily inspection data such as leak rates on CARB's webpage within 24 hours.[5] That information is included in this final inspection report.

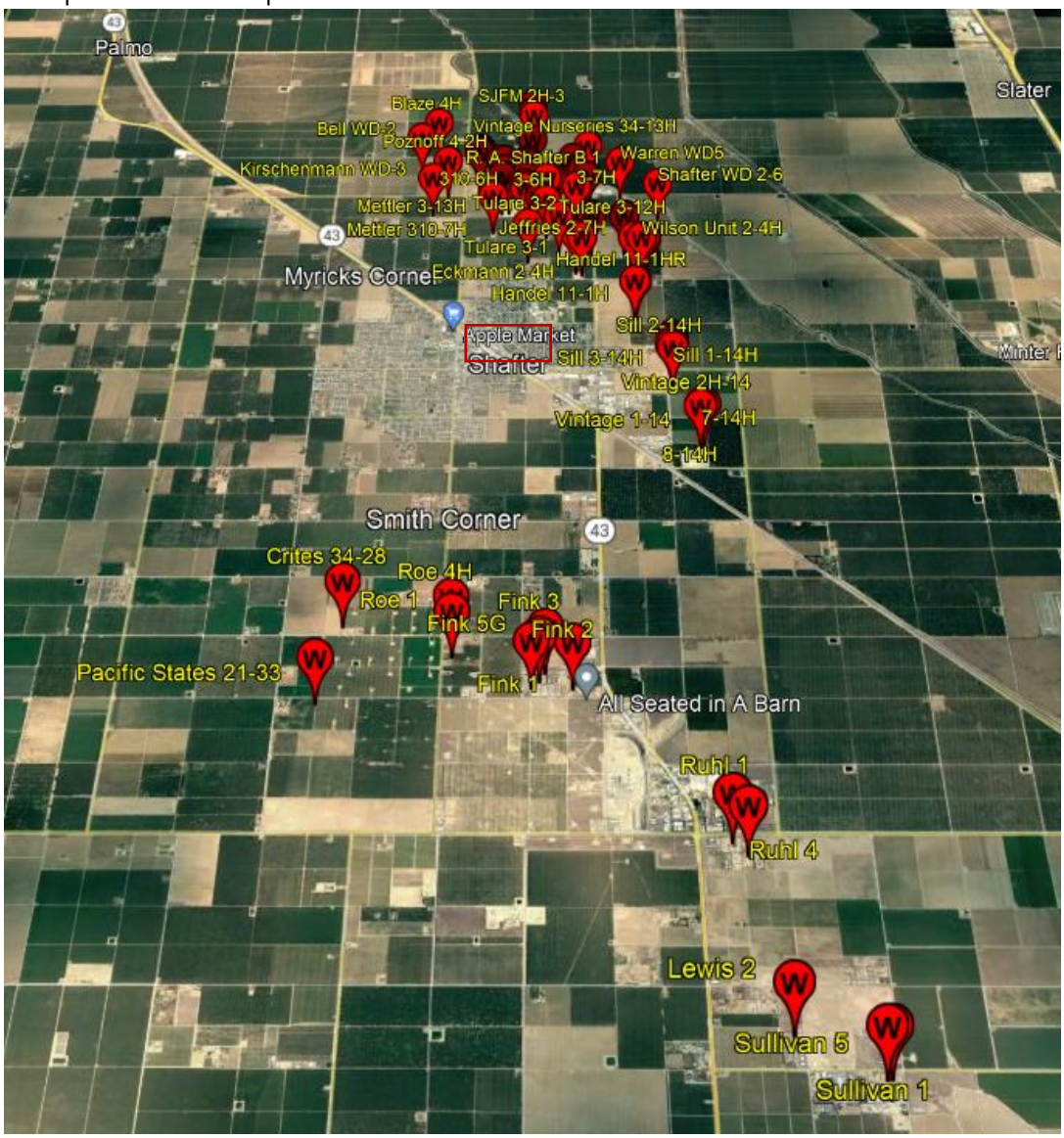
D. Inspection Updates

[4] Acute REL is an exposure that is not likely to cause adverse health effects in a human population, including sensitive subgroups, exposed to that concentration for the specified exposure duration on an intermittent basis. https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf

[5] https://ww2.arb.ca.gov/our-work/programs/oil-and-gas-enforcement/oil-and-gas-enforcement-inspection-reports

A brief status update on the inspections was provided to the CSC on October 9, 2023. The final results of the joint inspection will be presented at the CSC meeting scheduled for November 13, 2023.

Figure 1: Map of the 73 inspected wells



III. Inspection Summary

From September 12th to September 14th, 2023, MTF staff from CalGEM, CARB, and SJVAPCD conducted inspections on a total of 73 wells across three oilfields: Greeley, Rio Bravo, and Shafter-North. These wells are operated by three different companies: California Resources Production Corporation (CRC), Crimson Resource Management Corp (Crimson), and J.P. Oil Company (JP). Of the 73 wells inspected, 22 are considered critical, as they are

located within 100 feet of public streets or 300 feet of buildings. During these inspections, operator representatives were present and ready to repair any well found to be leaking.

Out of the 73 wells inspected, 18 wells operated by CRC were found to have leaks. Notably, three of these 18 wells had leaks exceeding a concentration of 50,000 parts per million (PPM). This concentration level is critical because it poses a potential ignition risk in the presence of an ignition source. These leaks dissipated to background levels, rendering them undetectable within three inches of the source. Immediate action was taken to promptly repair all three wells. Subsequently, these wells were re-inspected by SJVAPCD within two days to ensure their safety and compliance, and no further leaks as defined by COGR were detected.

COGR mandates that operators repair any methane leaks with concentrations of 1,000 ppm or higher. In comparison, CalGEM's regulations require production equipment to be maintained in a leak free condition, and operators are required to address all leaks, even those with concentrations below 1,000 ppm. Five (5) of the 18 wells were identified as leaking below 1,000 ppm, which require repair by CalGEM's regulation. During the inspections, 15 out of the 18 wells with leaks were successfully repaired per COGR standards.

Although the MTF developed a protocol to collect and analyze air samples from wells with leaks that met the specific thresholds discussed above, none of the leaking wells observed during these inspections met those defined thresholds. Therefore, no air samples were collected during this effort.

Figure 2: Map of the 18 leaking wells

Table 1 Critical data on the 73 wells inspected from September 12-14, 2023.

Ref #	API Number	Well Designation	API Gravity	Well Status	Leaks (PPM)	Operator	Inspection Date
1	04030191	Mettler 310-7H	27.5	Workover	-	CRC	9/12/23
2	04030276	Mettler 3-13H	27.5	Workover	-	CRC	9/12/23
3	04030157	310-6H	27.5	Active	2,000	CRC	9/12/23
4	04030433	Tulare 310-8H	27.5	Active	13,400	CRC	9/12/23
5	04030437	Kirschenmann WD-3	27.5	Idle	-	CRC	9/12/23
6	04030256	Poznoff 4-2H	27.5	Active	-	CRC	9/12/23
7	04030424	Vintage CGT 3-17	27.5	Idle	-	CRC	9/12/23
8	04030439	Mettler 310-9H	27.5	Active	176*	CRC	9/12/23
9	04030412	Vintage 3-15H	27.5	Active	1,445	CRC	9/12/23
10	04030421	SWICO 34-11H	27.5	Active	2,500	CRC	9/12/23
11	04030437	Vintage Nurseries	27.5	Active	-	CRC	9/12/23
12	04030074	Tulare 3-3H	27.5	Active	-	CRC	9/12/23
13	04030172	Wilson Unit 2-5H	27.5	Idle	-	CRC	9/12/23
14	04030166	Wilson Unit 2-4H	27.5	Active	-	CRC	9/12/23
15	04030210	Jeffries 2-7H	27.5	Active	700*	CRC	9/12/23
16	04030166	Wilson Unit 2-3H	27.5	Active	>50,000	CRC	9/12/23
17	04030202	Gary Unit 2-6H	27.5	Active	-	CRC	9/12/23
18	04030205	SWICO 34-9H	27.5	Active	-	CRC	9/12/23
19	04030092	Tulare 3-5H	27.5	Active	-	CRC	9/12/23
20	04030090	Tulare 3-4H	27.5	Active	10,000	CRC	9/12/23
21	04030264	Tulare 3-14	27.5	Idle	-	CRC	9/12/23
22	04030066	Tulare 34-4	27.5	Idle	-	CRC	9/12/23
23	04030172	Poznoff 4-1H	27.5	Active	174*	CRC	9/12/23
24	04030441	Poznoff 3-7H	27.5	Active	-	CRC	9/12/23
25	04030433	Poznoff 3-18H	27.5	Active	-	CRC	9/12/23
26	04030012	Tulare 34-1	27.5	Active	-	CRC	9/12/23
27	04030437	Bell WD-2	27.5	Idle	-	CRC	9/12/23
28	04030464	Blaze 4H	27.5	Active	509*	CRC	9/12/23
29	04030483	Sill 2-14H	26.9	Active	-	CRC	9/12/23
30	04030476	Sill 3-14H	26.9	Active	1,600	CRC	9/12/23
31	04030458	Sill 1-14H	26.9	Active	-	CRC	9/12/23
32	04030476	Sill 5-14H	26.9	Active	-	CRC	9/12/23
33	04030476	Sill 6-14H	26.9	Active	-	CRC	9/12/23
34	04030437	Eckmann 2-4H	27.5	Active	-	CRC	9/13/23
35	04030046	Tulare 3-1	27.5	Active	>50,000	CRC	9/13/23
36	04030055	Tulare 3-2	27.5	Plugged	-	CRC	9/13/23
37	04030210	Tulare 3-12H	27.5	Active	-	CRC	9/13/23
38	04030157	3-8H	27.5	Idle	-	CRC	9/13/23
39	04030498	Tulare 3-16H	27.5	Active	417*	CRC	9/13/23

Ref #	API Number	Well Designation	API Gravity	Well Status	Leaks (PPM)	Operator	Inspection Date
40	04030172	Tulare 3-10H	27.5	Idle	-	CRC	9/13/23
41	04030508	Shafter WD 2-6	27.5	Active	-	CRC	9/13/23
42	04030420	Vintage 1-14	26.9	Active	22,000	CRC	9/13/23
43	04030420	Vintage 2H-14	26	Idle	>50,000	CRC	9/13/23
44	04030484	7-14H	26.9	Active	-	CRC	9/13/23
45	04030484	8-14H	26.9	Active	1,100	CRC	9/13/23
46	04030247	Handel 11-1H	27.5	Idle	-	CRC	9/13/23
47	04030267	Handel 11-1HR	27.5	Active	2,800	CRC	9/13/23
48	04030487	Warren WD5	27.5	Active	-	CRC	9/13/23
49	04030439	Jacobsen WD1	27.5	Idle	-	CRC	9/13/23
50	04029672	R. A. Shafter A 1	27.5	Active	-	CRC	9/13/23
51	04030155	3-7H	27.5	Active	-	CRC	9/13/23
52	04030148	3-6H	27.5	Active	-	CRC	9/13/23
53	04030139	North Shafter 1H-3	27.5	Active	-	CRC	9/13/23
54	04029679	R. A. Shafter B 1	27.5	Active	-	CRC	9/13/23
55	04030463	Eckmann 2-5H	27.5	Active	3,200	CRC	9/13/23
56	04030437	Jacobsen 34-3H	27.5	Idle	-	CRC	9/13/23
57	04030463	Vintage Nurseries	27.5	Active	-	CRC	9/13/23
58	04030427	SJFM 2H-3	27.5	Idle	-	CRC	9/13/23
59	04030194	SWICO 34-8H	27.5	Idle	-	CRC	9/13/23
60	04030172	SWICO 34-7H	27.5	Idle	-	CRC	9/13/23
61	04029085	Sullivan 1	36	Idle	-	Crimson	9/14/23
62	04029085	Sullivan 5	34	Idle	-	Crimson	9/14/23
63	04029085	Lewis 2	36	Idle	-	Crimson	9/14/23
64	04029167	Ruhl 4	32-40	Idle	-	JP	9/14/23
65	04029166	Ruhl 1	32-40	Idle	-	JP	9/14/23
66	04029165	Fink 1	32-40	Plugged	-	JP	9/14/23
67	04029165	Fink 2	32-40	Idle	-	JP	9/14/23
68	04029165	Fink 5G	N/A	Idle	-	JP	9/14/23
69	04029165	Fink 3	32-40	Idle	-	JP	9/14/23
70	04029166	Roe 1	32-40	Active	-	JP	9/14/23
71	04029165	Roe 4H	32-40	Workover	-	JP	9/14/23
72	04029166	Pacific States 21-33	32-40	Workover	-	JP	9/14/23
73	04029166	Crites 34-28	32-40	Active	-	JP	9/14/23

*Methane leaks at this concentration are required to be repaired under CalGEM's requirements.

IV. Status of Well Repairs

At the conclusion of the joint inspections on September 14, 2023, leaks subject to COGR were repaired and re-inspected, except for the following seven leaks: five leaks greater than 1,000 ppm, one leak greater than 10,000 ppm, and one leak greater than 50,000 ppm. On

September 15, 2023, CRC repaired and SJVAPCD re-inspected these seven leaks, as shown in Table 2.

Table 2 CRC wells with leaks subject to COGR, re-inspected on September 15, 2023

Operator	Well API Number (Name)	Methane Leak (PPM)	Repaired Date	Re-inspection Date
CRC	0403015783 (310-6H)	2,000	9/15/23	9/15/23
CRC	0403043347 (Tulare 310-8H)	1,445	9/15/23	9/15/23
CRC	0403042114 (SWICO 34-11H)	2,500	9/15/23	9/15/23
CRC	0403026797 (Handel 11-1HR)	>1,000	9/13/23	9/15/23
CRC	0403048477 (Vintage 1-14H)	>1,000	9/13/23	9/15/23
CRC	0403042052 (Vintage 2-14H)	78,700	9/13/23	9/15/23
CRC	0403042051 (Vintage 1-14H)	22,000	9/13/23	9/15/23

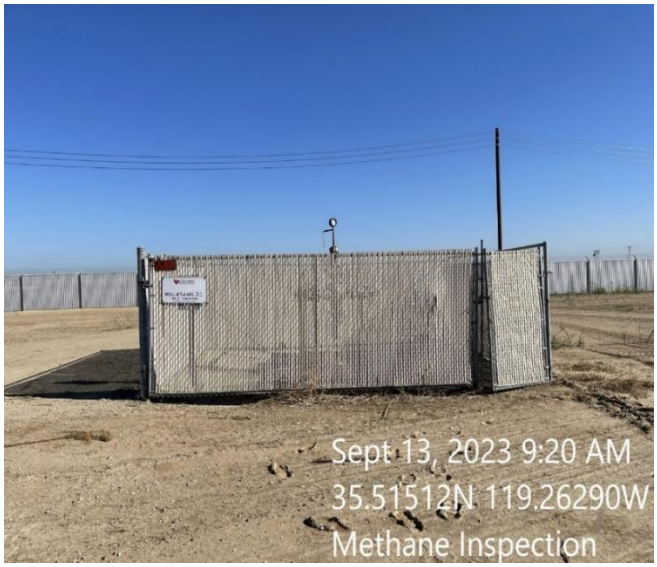
On September 15, 2023, all leaks subject to CARB and SJVAPCD requirements had returned to compliance but had not yet met the compliance requirements of CalGEM. All findings discovered during the inspections were re-inspected by CalGEM field staff in accordance with their compliance policies. Return to compliance under CalGEM requirements was achieved on November 6, 2023.

<u>Additional information on the three CRC wells with leaks over 50,000 ppm:</u>

As of September 18, 2023, all three wells were repaired and passed inspection. These wells were re-inspected on September 12, September 13, and September 15, 2023.

- Wilson Unit 2-3H: Repaired. This well was initially determined to be leaking on September 12, 2023, with a leak detected at the threaded union on the casing line, measuring 79,600 ppm. The leak was successfully repaired on-site and passed re-inspection on the same day.

- Tulare 3-1: Repaired. This well was first determined to be leaking on September 13, 2023, with a leak detected at the casing valve, measuring 75,200 ppm. The leak was repaired on-site and passed re-inspection on the same day.



- Vintage 2-14H: Repaired. This well was first determined to be leaking on September 13, 2023, with a leak detected at the valve stem, measuring 78,700ppm. The leak was repaired and passed re-inspection on September 15, 2023.

V. Enforcement Actions

Each agency has specific authority to address leaks from oil and gas wells. These authorities are the basis for all enforcement actions taken.

- CARB has the authority to regulate greenhouse gas emissions from stationary sources under Health and Safety Code sections 38562, 39600, 39601, 39602.5, and 39659. CARB also regulates leaks from oil and gas operations under the Greenhouse Gas Emissions Standards from Crude Oil and Natural Gas facilities, California Code of Regulations, title 17, sections 95665, et seq.[6]
- CalGEM has broad authority to regulate oil and gas production operations and address methane leaks from oil and gas operations. Public Resources Code section 3106 provides the supervisor with broad authority to supervise the drilling, operation, maintenance, and abandonment of wells and facilities to "prevent, as far as possible, damage to life, health, property, and natural resources ..." Additionally, PRC section 3011 provides that CalGEM's mandate includes "protecting public health and safety and environmental quality, including reduction and mitigation of greenhouse gas emissions associated with the development of hydrocarbon ... resources in a manner that meets the energy needs of the state." CalGEM has adopted regulations designed to encourage good oil and gas field practices and to prevent damage to life, health, property, and natural resources. California Code of Regulations, title 14, section 1777, subdivision (a) requires that "operators shall maintain production facilities in good condition and in a manner to prevent leakage or corrosion and to safeguard life, health, property, and natural resources."
- SJVAPCD has the authority to address leaks from oil and gas operations under District Rules and has been delegated authority through a Memorandum of Agreement to implement and enforce CARB's Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities within the San Joaquin Valley.

CalGEM issued a Notice of Violation for 18 violations of California Code of Regulation (CCR), Title 14, Section 1777, subdivision (a), which states that: "Operators shall maintain production facilities in good condition and in a manner to prevent leakage or corrosion and to safeguard life, health, property, and natural resources". Furthermore, the Public Resources Code (PRC) section 3011 subdivision (a) provides that CalGEM's mandate includes "protecting public health and safety and environmental quality, including reduction and mitigation of greenhouse gas emissions associated with the development of hydrocarbon and geothermal resources in a manner that meets the energy needs of the state."

A Notice of Violation was issued by the San Joaquin Valley Air Pollution Control District to California Resource Production Corporation for three leaks > 50,000 ppm in violation of Section 95669 of the California Code of Regulations, Title 17.

[6] https://ww2.arb.ca.gov/resources/documents/oil-and-gas-regulation

VI. Additional Inspection Information

Inspection Staff

- Rohit Sharma (CalGEM) (September 12)
- David Cookey-Gam (CalGEM) (September 12)
- Cristian Garcia (CalGEM) (September 12)
- Sade Haake (CalGEM)
- Victor Medrano (CalGEM)
- John Wilson (CalGEM)
- Terry Allen (CARB) (September 12, 13)
- Leng Mut (CARB)
- Shola Adegunwa (CARB)
- Ellie Rodriguez (CARB)
- Alex Oregon (SJVAPCD)
- Jaime Brownlow (SJVAPCD) (September 12, 13)
- Cristian LaFore (SJVAPCD) (September 14)

Equipment Used

During the inspection, inspectors measured methane leak concentrations from wells using Method 21 (Volatile Organic Compound Leaks) approved equipment[7]:

- Eagle 2
- Toxic Vapor Analyzer (TVA)

To screen for leaks, inspection staff used:

- Forward Looking Infrared (FLIR) cameras
- Irwin
- Gazoscan

[7] Leaks measured using USEPA Method 21 https://www.epa.gov/emc/method-21-volatile-organic-compound-leaks

Works Cited

"Methane Task Force" *CalGEM*, n.d., https://www.conservation.ca.gov/calgem/Pages/Methane-Task-Force.aspx. Accessed 22 Sep 2023.

"WellSTAR" *CalGEM*, n.d., https://wellstar-public.conservation.ca.gov/Well/Well/Index. Accessed 22 Sep 2023.