



South Coast
AQMD

Rule 1148 Series Requirements for Oil and Gas Wells



Working Group Meeting No. 2
September 14, 2023 – 3:00 pm

Zoom URL: <https://scaqmd.zoom.us/j/91059546550>

Dial In: 1 669 900 6833

Webinar ID: 910 5954 6550 (applies to all)

Agenda

- Summary of Working Group Meeting #1
- Overview of Oil & Gas Wells
- Rule 1148.1 Applicability and Current Leak Standards
- Best Available Retrofit Control Technology (BARCT)
- Rule 1148.1 Rule Concepts
- Update on Rule 1148.2
- Ongoing Efforts and Next Steps

Summary of WGM #1

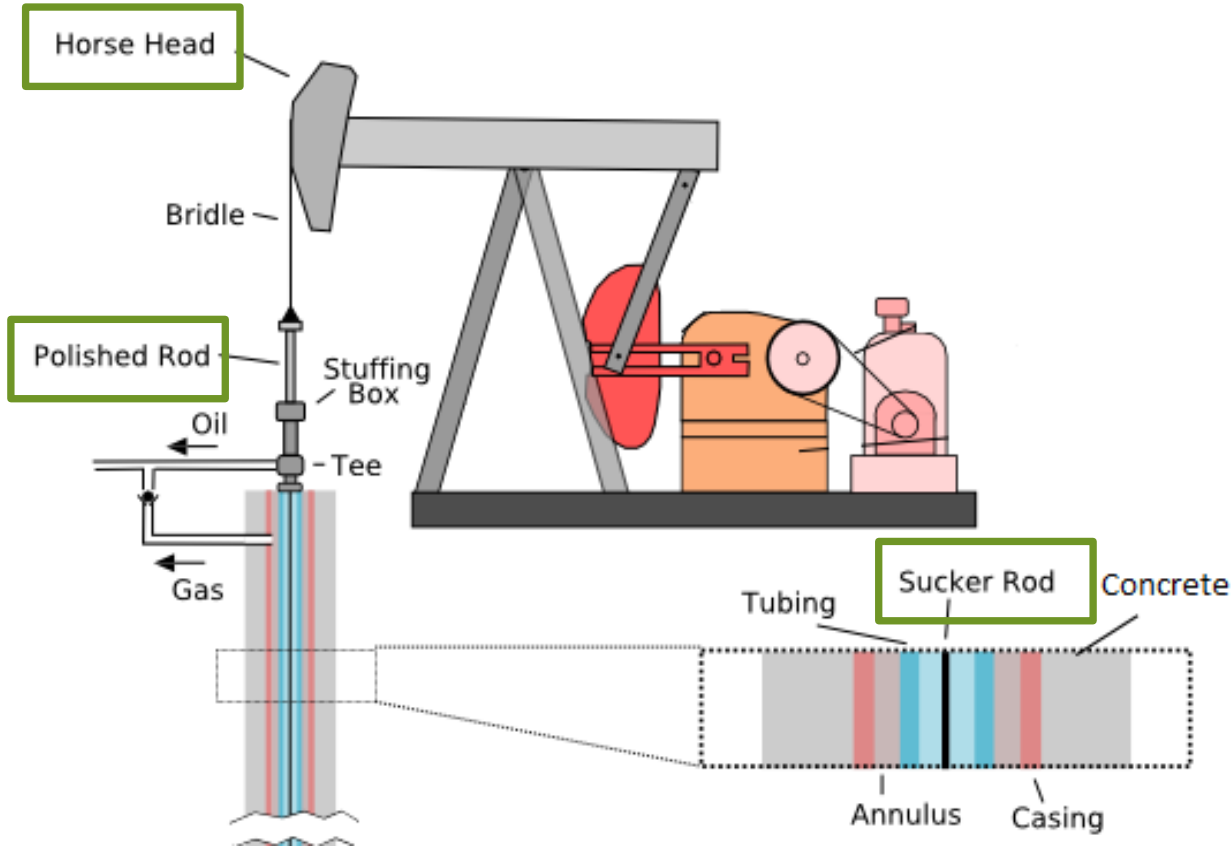


- Discussed background on South Coast AQMD Rule 1148 series of rules
 - Rule 1148.2 amended on February 2023
- Reviewed AB617 community concerns related to R1148.1 for Wilmington, Carson, West Long Beach (WCWLB) and for South Los Angeles (SLA)

An aerial photograph of a city, likely Los Angeles, viewed from a high vantage point. The city is densely packed with buildings and greenery. In the foreground, a large, semi-transparent image of an oil pumpjack (jack-o'-lantern) is overlaid, extending from the left side towards the center. The pumpjack is a complex mechanical structure with a long walking beam and a counterweight. The overall scene is a mix of urban development and industrial infrastructure.

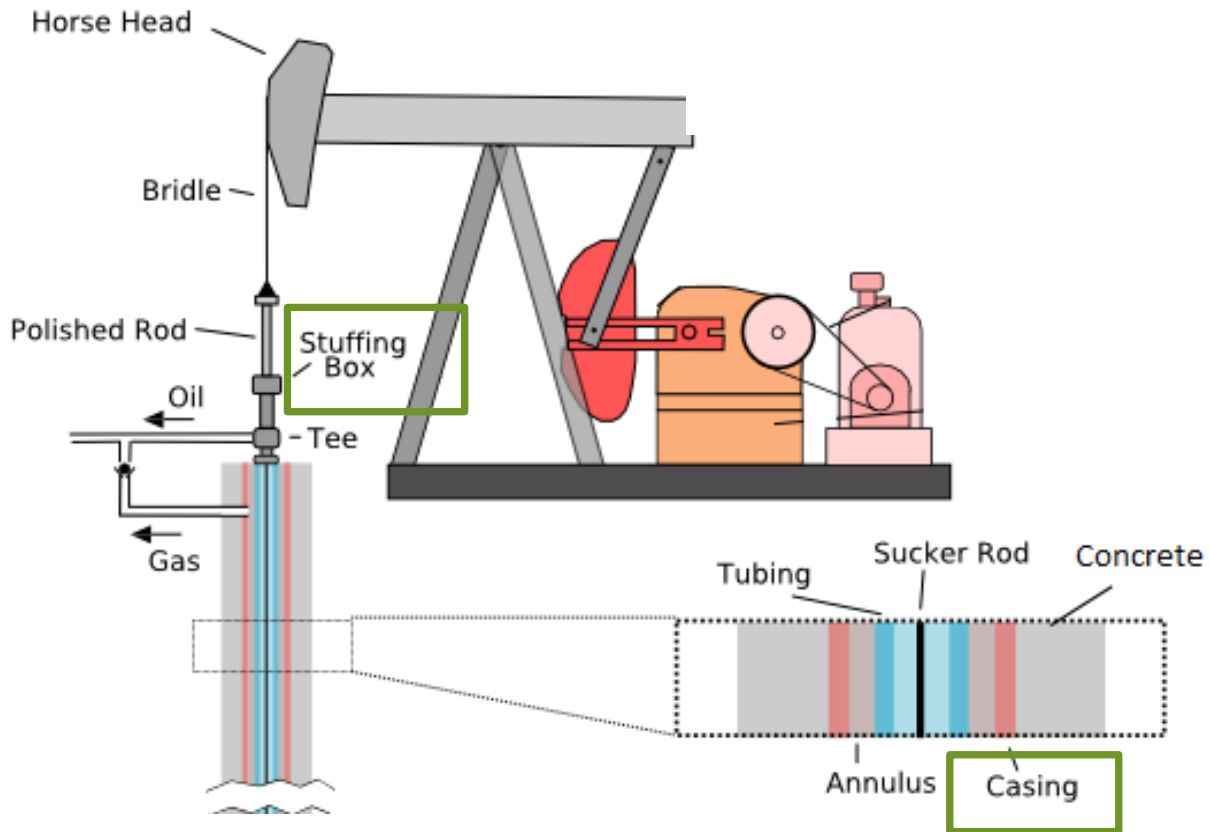
Overview of Oil & Gas Wells

Oil Wells – Pumpjack



- An oil well is a conduit to access oil and natural gas from the subsurface
- A pumpjack, also known as a horsehead pump, is used to bring liquid and gas from the ground to the surface
- A polished rod moves in and out of the tubing without fluid escaping and is connected to sucker rods which run through the tubing

Oil Wells – Casing and Stuffing Box

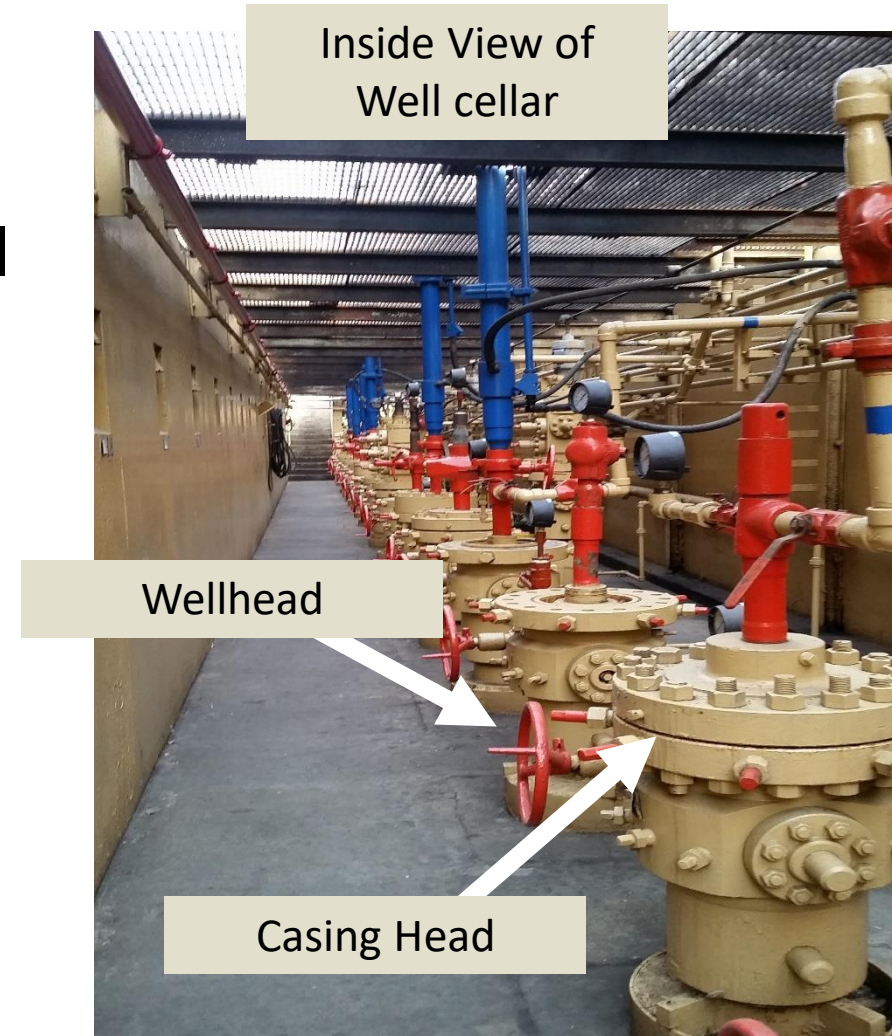


- Well casing is the lining that is inserted between edge of well and the well itself for structural support
- Stuffing Box is packing gland or “box” that holds packing material around moving pump rod to reduce escape of gas or liquid
- Horseheads are primarily driven by an electric motor

Oil Wells – Well Cellar and Wellhead




- Well cellar - a lined or unlined containment surrounding one or more oil wells
- Wellhead - an assembly of valves mounted to the casing head of an oil well
- Casing head - a metal flange welded or screwed on to the top of the casing and forms part of the wellhead system



Oil Wells – Oil and Gas Handling

- Oil pumped to holding tanks for water/oil separation
- Gas either routed to a flare or recovered for other uses such as:
 - Cleaned up removing impurities and sold to a gas company
 - Used in turbines for electrical production

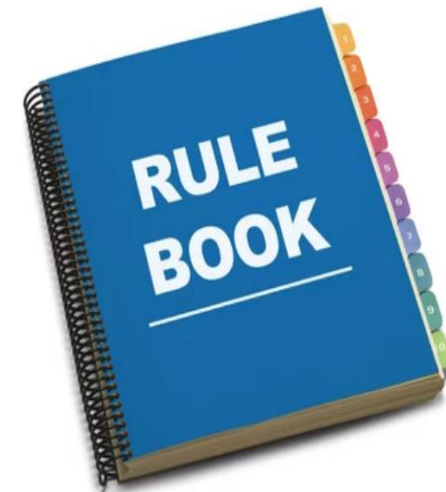


The background image shows an aerial view of an oil field with several pumpjacks (oil pumps) in the foreground and middle ground. In the background, there is a residential area with houses and streets. The image is slightly faded to make the text stand out.

Rule 1148.1 Applicability and Current Leak Standards

South Coast AQMD Rule Applicability

- Rule 1148.1 applies to oil producing wells, well cellars, and produced gas handling operation and maintenance activities
 - Includes facilities that produce, gather, separate, process and store produced gas
- Other South Coast AQMD Rules that may apply to oil & gas production sites:
 - Rule 463 – *Organic Liquid Storage* applies to storage tanks
 - Rule 1118.1 – *Control of Emissions from Non-Refinery Flares* applies to flares
 - Rule 1134 – *Emissions of Oxides of Nitrogen from Stationary Gas Turbines* applies to turbines 0.3 megawatt (MW) and larger
 - Rule 1173 – *Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants* applies to components including valves, flanges, fittings, etc.
 - Rule 1176 – *VOC Emissions from Wastewater Systems* applies to wastewater systems



Current Leak Standards



- To inspect equipment, operator required to conduct quarterly inspections of all well cellars using a Toxic Vapor Analyzer (TVA) to measure for TOC and Volatile Organic Compounds (VOCs)
- Operator of an oil and gas production facility shall not allow Total Organic Compound (TOC) concentration in a well cellar greater than 500 ppm
 - South Coast AQMD Rules 463, 1173, and 1176 have comparable 500 ppm limits for VOCs
 - Rule 1118.1 has NO_x, VOC, and CO limits for flares
 - Rule 1134 has NO_x limits that vary depending on size of gas turbines

Current Leak Standards (cont.)

General TOC limit of 500 ppm in the well cellar for components and equipment with additional restrictions

- Operator required to pump out any accumulated organic liquid from well cellar when TOC exceeds 250 ppm within 5 calendar days or end-of-business day if well located within 1,500 feet of a sensitive receptor
- Operator required to repair any leak greater than 250 ppm TOC for produced gas handling equipment within 100 meters (328 feet) of sensitive receptors

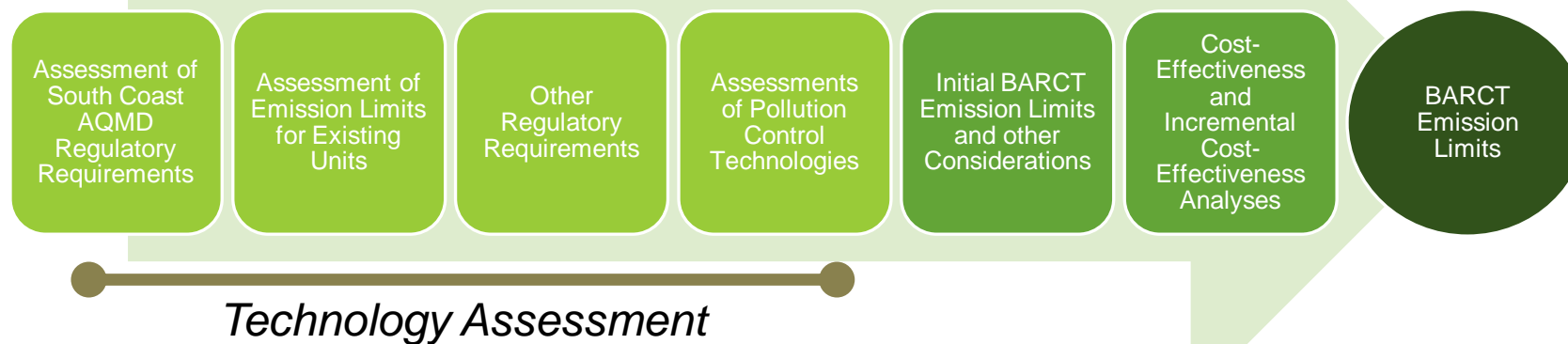


The background of the slide is a faded, grayscale image of an industrial facility. In the center, a large crane with a long horizontal boom is visible. To the left, there are several large, rectangular industrial buildings or storage tanks. The overall scene is somewhat hazy, suggesting a misty or overcast day. The text is overlaid on this background.

Best Available Retrofit Control Technology (BARCT)

BARCT Assessment

- Staff will conduct a BARCT assessment to determine if any proposed control option is feasible and warranted for the rule.
- Health and Safety Code section 40406 defines BARCT as “... *an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class and category of source.*”
- BARCT must adhere to Health and Safety Code Section 40920.6
 - Cost-effectiveness and incremental cost-effectiveness must be determined for each progressively more stringent potential control option



An aerial photograph of a city, likely Los Angeles, viewed from a high vantage point. In the foreground, a large, green, geometric structure, possibly a sculpture or architectural element, is partially visible. The city below is densely packed with buildings, roads, and green spaces. The sky is clear and blue.

Rule 1148.1 Rule Concepts

FUG-01 Improved Leak Detection and Repair

- The Air Quality Management Plan (AQMP) is a blueprint on how to meet air quality standards
- 2016 and 2022 AQMPs included a control measure FUG-01 designed to implement the use of advanced leak detection technologies:
 - OGI usage
 - Gas sensors
 - Open path detection devices
- PAR 1148.1 seeks to further reduce VOC emissions from fugitive leaks



Review of Community Concerns



Two CERPs highlighted community concerns with oil and gas production sites with recommendations:

- Enhanced leak detection technology via Optical Gas Imaging (OGI)
- Fenceline monitoring
- Electrification of machinery and equipment used at oil production sites
- Limit or eliminate odorant use, potential usage of odorless neutralizing agents, and limiting/banning of certain odorants
- Additional signage requirements

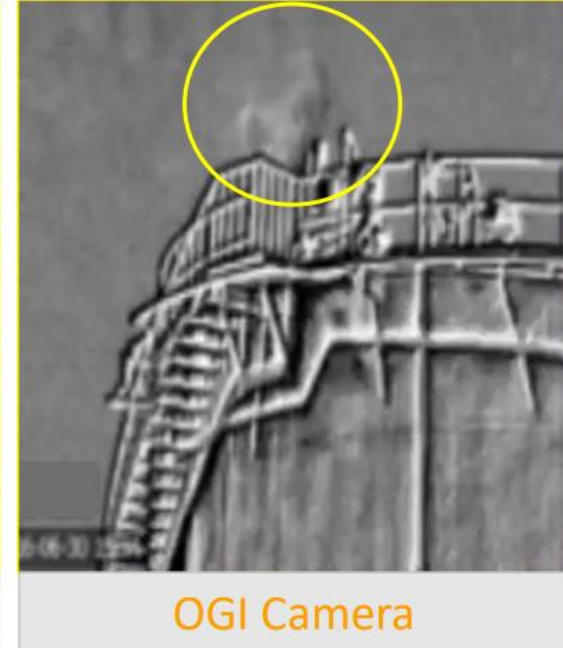
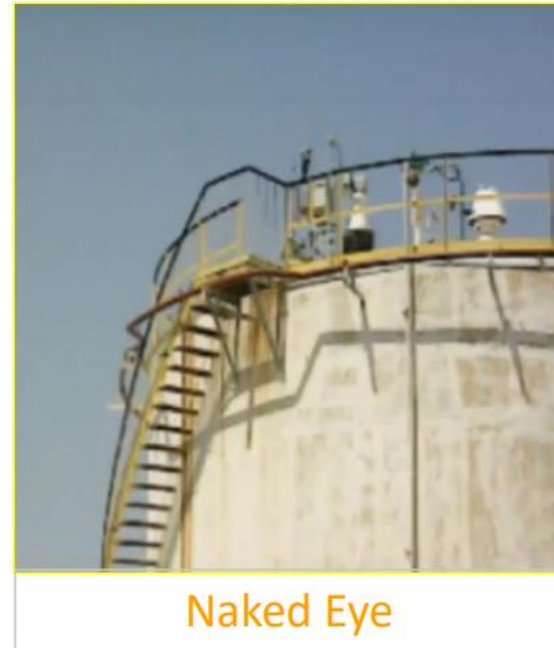
OGI Devices

- Detects VOC hydrocarbons based on their atomic spectrum
- Helps to pinpoint leaks easier/quicker compared to only using a TVA alone
- Assists in recording images of leaks
- Identifies leaks in inaccessible areas



Use of OGI

- Produces images of vapors not seen with ordinary vision
- Compliance staff and some facilities currently use OGI during their inspections
- Staff is considering requiring the use of OGI cameras on a periodic basis for leak detection
 - Earlier leak detection leads to sooner correction and emission reductions
- Possible higher frequency of OGI usage if leak is detected

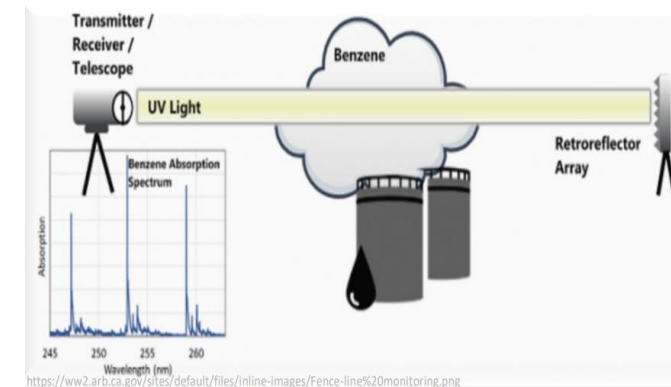


Fenceline Monitoring



Stationary gas sensor

- Two types of fenceline monitors typically used:
 - Stationary gas sensors detect gas and/or VOC emissions once it makes contact with its sensor
 - Open path detection devices produce beam across an area and alert when emissions crosses with beam
- Advantages
 - Detectable limit < 1 ppmv for VOCs and other air pollutants such as benzene
 - Continuous monitoring
- Disadvantages
 - High costs
 - Unless gas passes over sensor or beam path detection of molecule may not occur
 - Covers a limited spatial range



Open path detection device

Equipment Electrification



- Community stakeholders raised concerns over the use of combustion equipment at oil and gas production sites
- Staff visited several sites and observed:
 - Majority of pumps at oil and gas wells are electrically driven; some pumps were fueled by produced gas from site
 - Other Combustion equipment included:
 - Microturbines – used to generate electricity powered by produced gas from site
 - Workover rigs – majority powered by diesel engines

Microturbines

- Use produced or “waste” gas for beneficial use to produce electricity
- Alternative to flaring waste gas
- Reduce electrical demand stress on local grid
- May be used to supplement existing local grid during peak electrical demand
- Registered equipment with South Coast AQMD
- NOx emissions < 9 ppmvd



Workover/Drilling Rigs

- Staff identified two electrified workover/drilling rigs operated in the South Coast AQMD
- Observations:
 - Electric rigs cannot be moved offsite due to size and weight
 - Electrical infrastructure requires significant investment to power the rigs
 - Cost of an electric workover/drilling rig quoted over a million dollars per unit
- Current practice is to encourage use of combustion engines
 - Some facilities using lower-emitting Tier IV diesel engines



Use of Odorants

- Chemicals have been used to either:
 - Mask (or hide) odors generated at sites
 - Neutralize odors, without masking them
 - Purposefully add odorant to identify odorless gases like natural gas
- Staff considering:
 - Banning odorants that are used for masking odors created at oil field production sites and facilities
 - Allow continued usage of neutralizing agents that do not contribute to creating new odors
 - Allow continued use of odorants for odorless gases (e.g., natural gas) to identify leaks and safety concerns



Odorant mist system



Mercaptan storage tank

Additional Signage Considerations

- Rule 1148.1 (d)(13) requires signage to include:
 - Name of facility
 - Facility call number
 - Instructions to call South Coast AQMD's 1-800-CUT-SMOG complaint hotline number
- Staff is considering additional signage requirements to include:
 - Instructions to AQMD's website to sign up for oil and gas notifications
 - Minimum sizing requirements
 - Location placement



An aerial photograph of an oil field. In the foreground, two pumpjacks are visible on a dirt road. The background shows a vast expanse of land with numerous other pumpjacks and some buildings, all under a clear sky. The text "Update on Rule 1148.2" is overlaid in the center of the image.

Update on Rule 1148.2

Follow-Up on Notification Efficacy



On May 19th, staff updated the Stationary Source Committee:

- Provided costs & efficacy associated with paper and electronic notifications
- Received comments from stakeholders highlighting the pros and cons of paper mailings pursuant to recent Rule 1148.2 requirement
- No further direction was provided
- No further amendments being considered



Rule 1148.2 Website Updates

Rule 1148.2 - Oil and Gas Well Electronic Notification and Reporting

Oil & Gas Well Notification

Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Well and Chemical Suppliers was adopted on April 5, 2013. Effective June 4, 2013, oil and gas well operators and chemical suppliers are required to electronically submit to the South Coast AQMD various types of reports related to well drilling, well completion, and well reworks. In addition, the South Coast AQMD is required to make certain information regarding these activities available to the public.

Rule 1148.2 was last amended on February 3rd, 2023. The amendment added notification requirements for injection well acidizing, chemical treatment, and for workover rigs that do not use a Tier 4 Final low emission engine or a non-combustion source.



Click on a link below to access either of the Notification and Reporting, Public Information, Chemical Information, or Annual Report portals.

<p>Operators & Chemical Suppliers</p>	<p>Notification and Reporting Portal</p> <ul style="list-style-type: none">- Create and manage account- File notifications and reports <p>Click Here for Mailer Template</p>
<p>Community Members</p>	<p>Public Information Portal</p> <ul style="list-style-type: none">- View well activity information and chemical usage- Sign up to receive emails for well event

- Electronic notifications and Rule 1148.2 website¹ updated to provide links to Office of Environmental Health Hazard Assessment (OEHHA)²
- Website updated to provide a template for direct mailings
- Operator portal updated per recent amendments requiring notifications for non-Tier 4 final engine use on workover rigs, chemical treatment, and injection well acidizing jobs

¹ <http://www.aqmd.gov/home/rules-compliance/compliance/1148-2>

² <https://oehha.ca.gov/air/chemicals>

Ongoing Efforts and Next Steps

The background of the slide is a faded, grayscale image of an industrial facility. In the center, a large pumpjack (oil pump) is visible, with its characteristic walking beam and counterweights. The structure is supported by a metal frame. In the background, there are several large, rectangular industrial buildings or storage tanks. The sky is a uniform, light gray, suggesting an overcast day. The overall image is semi-transparent, allowing the text to be clearly legible.

Rule Development Process

Information Gathering – Meet with Stakeholders



Define Rule Objective and Scope



Develop Rule Concepts



Draft Proposed Rule Language

Proposed Rule Schedule for PAR 1148.1



Staff Contacts

South Coast AQMD staff is available to assist you with any questions or comments



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