

VENTURA COUNTY APCD

STAFF REPORT

Proposed New Rule 74.35, Flares

July 2023 - DRAFT

EXECUTIVE SUMMARY

Staff is proposing new Rule 74.35 to reduce Nitrogen Oxides (NO_x) and Reactive Organic Compound (ROC) emissions from operations of any source involving the use of flares where the total rated heat input for the unit is 1 million (MM) British thermal units (Btu) per hour or greater. The proposed new rule is based on flare rules adopted in the South Coast Air Quality Management District (SCAQMD) and San Joaquin Valley Air Pollution Control District (SJVAPCD).

This rule development will implement Every Feasible Measure as required by the California Clean Air Act, California Health and Safety Code (CHSC) Section 40919. Ventura County Air Pollution Control District's (VCAPCD or District) 2016 Air Quality Management Plan (AQMP) relies on adopting All Feasible Measures to help attain the state ambient ozone air quality standard. In addition, the adoption of this rule satisfies Assembly Bill (AB) 617, which was approved on July 26, 2017, by Governor Jerry Brown. As amended by Assembly Bill 617 (C. Garcia, Chapter 136, Statutes of 2017), Health and Safety Code section 40920.6(c) requires each local air district that is nonattainment for one or more air pollutant(s) to adopt an expedited schedule for the implementation of Best Available Retrofit Control Technology (BARCT) for each industrial source that, as of January 1, 2017, was subject to a specified market-based compliance mechanism, the Cap and Trade Program, and gives highest priority to those permitted units that have not modified emissions-related permit conditions for the greatest period of time.

The adoption of Rule 74.35 is the District's third step in implementing the expedited BARCT rule adoption schedule approved on December 11, 2018, by the Ventura County Air Pollution Control Board (Board) to satisfy AB 617 requirements. Rule 74.35 is a new rule regulating flare equipment in operations of oil and gas, landfills, digesters, and ROC liquid loading facilities. Currently, there are 43 facilities in Ventura County with a total of 64 flares. The implementation date has been established as January 1, 2024. The State Implementation Plan (SIP) creditable emission reductions obtained by implementing the proposed emission limits is estimated at 6.916 tons per year (tpy) of NO_x and 6.069 tpy of ROC beginning 2027, when the rule is fully implemented, and the time allowed to replace flares exceeding capacity thresholds has passed. Additional emission reductions may be achieved over time as older equipment is replaced with new equipment meeting proposed emission limits for new, replacement, and relocated flares.

The proposed Rule 74.35 establishes emission limits for NO_x, ROC, and carbon monoxide (CO) for new flares, and a capacity threshold for existing flares. In addition, some new flares at oil and gas production facilities will have additional limitations. Proposed Rule 74.35 also establishes provisions for source testing, monitoring, reporting, recordkeeping, and provides exemptions for low-use and low-emitting flares.

The District currently does not have a source-specific rule that regulates NO_x emissions from existing non-refinery flares. As a region in a serious non-attainment for ozone, VCAPCD is required by U.S.EPA to adopt all Reasonably Available Control Measures or Reasonably Available Control Technologies, particularly when adopted by other air agencies. Proposed Rule 74.35 is also needed to reduce NO_x emissions, establish BARCT requirements, and reduce NO_x and ROC emissions from non-refinery flares and encourage alternatives to flaring, such as energy generation, transportation fuels, or pipeline injection.

Proposed Rule 74.35 establishes emission limits for NO_x and ROC, and CO for new, replaced, or relocated flares, and establishes industry-specific annual capacity thresholds for existing flares. The capacity thresholds serve as a metric to identify routine flaring and applies to open flares and flares that combust digester gas, landfill gas, and gas produced from oil and gas production facilities. Flares that operate greater than the annual capacity threshold will be required to either reduce flaring below the capacity threshold or replace the flare with a unit complying with the proposed emissions limits for new flares.

This report contains five additional sections: (1) Background, (2) Proposed Rule Requirements, (3) Comparison of Proposed Rule Requirements with Other Air Pollution Control Requirements, (4) Impact of the Proposed Rule, and (5) Environmental Impacts of Methods of Compliance.

The first section provides background information including regulatory history, air pollution control technology and source description. The second section explains the key features of the proposed requirements. The third section compares the proposed requirements with existing federal requirements and Best Available Control Technology (BACT). The fourth section is an analysis of the proposed amendment's effect on NO_x emissions, cost-effectiveness, and socioeconomic impacts. The last section examines the environmental impacts of compliance methods and the mitigations of those impacts.

BACKGROUND

Introduction

Rule 74.35, Flares, applies to flares used at oil and gas production sites, landfills, wastewater treatment plants, and most open flares. The main purpose of this rule is to limit NO_x and ROC emissions which are precursors to ground-level ozone formation. Ventura County is currently designated as “serious” nonattainment for federal National Ambient Air Quality Standards and designated nonattainment for state Ambient Air Quality Standards for ground level ozone. Ventura County is required by the California Clean Air Act (California Health and Safety Code Section 40914) to adopt “every feasible measure” as an alternative requirement to reducing ozone precursor emissions by a minimum of five percent per year. The District considers this proposal a feasible measure that will reduce NO_x and ROC emissions.

Assembly Bill 617

On July 26, 2017, AB 617 was approved by Governor Jerry Brown and focuses on reducing criteria pollutants and toxic air contaminants from stationary sources. Among the requirements of AB 617 is an expedited schedule for implementing BARCT for each industrial source that, as of January 1, 2017, was subject to the Cap and Trade Program and gives highest priority to those

permitted units that have not modified emissions-related permit conditions for the greatest period of time. The highest priority would be given to older, higher-polluting units that will need to install retrofit emission control technology.

BARCT Implementation

The California Health and Safety Code (CHSC) Section 40920.6(c), as amended by AB 617, requires that on or before January 1, 2018, each local air district that is nonattainment for one or more air pollutants must adopt an expedited schedule for the implementation of BARCT by the earliest feasible date. On December 11, 2018, the Board approved an expedited BARCT rule adoption schedule. This expedited schedule includes a tentative deadline of December 31, 2023, to adopt Rule 74.35, Flares.

Staff assessed BARCT for this source category. BARCT is defined in the CHSC Section 40406 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 or category of source.” Consistent with state law, BARCT emission limits take into consideration environmental impacts, energy impacts, and economic impact. In addition to the NO_x and ROG reductions sought in the proposed new rule, other potential environmental effects of the proposed rule were evaluated through the California Resource Code 21159 process.

All permitted facilities subject to Rule 74.35 were reviewed for feasibility of emission reductions and cost-effectiveness in the rule development process. After investigation, staff found only four flares are likely to be required to act to address exceedances of the capacity thresholds.

NO_x and ROG Emission Sources

Staff examined all permitted units potentially subject to proposed new Rule 74.35. Flares are used to burn combustible industrial waste gas to control ROG and toxic air contaminant emissions that would occur if the gas was vented. Flares generate NO_x and ROG emissions during operation. Combined potential to emit (PTE) and 2021 actual emissions from all permitted flares in Ventura County are shown in Table 1.

Table 1: Existing Flare Emissions in Ventura County

Flare Type	Count	Total ROG PTE (tpy)	Total NO _x PTE (tpy)	Actual ROG (tpy)	Actual NO _x (tpy)
Oilfield	29	32.15	42.89	8.49	16.50
Emergency	19	30.37	38.41	8.64	15.40
Landfill Gas	6	33.68	66.75	11.38	22.60
Digester Gas	5	5.93	7.35	3.16	2.15
Waste Gas Burner (flare)	1	2.36	3.10	0.03	0.03
Exempt	4	0.80	1.06	0.17	0.08
TOTAL	64	105.29	159.56	31.87	56.76

BARCT Emission Limits and Other Considerations

The recommendation for the NO_x and ROC BARCT emission limits were established using information gathered from existing VCAPCD regulations, existing permitted facilities in the District, regulatory requirements for other air districts, and the technology assessment. Both retrofit and new/replacement installations are considered. Once the initial limits are established, a cost-effectiveness determination is made at that initial limit. If the initial limit is not cost-effective, an alternative limit may be recommended. Unique circumstances are taken into consideration to distinguish alternative limits, provide alternative means for emission reductions, or to create provisions in the rule to address flares where retrofit or replacement would otherwise not be cost-effective.

Vapor Control Technology

The primary vapor control technology used in Ventura County involves the routing of displaced gas to fuel gas systems, sales gas systems, or flaring. Facilities which do not utilize the previously mentioned methods will typically use carbon adsorption systems but may also use scrubbers or catalytic oxidation to control the release of NO_x and ROCs.

PROPOSED NEW RULE REQUIREMENTS

Purpose and Applicability

The proposed rule will reduce emissions NO_x and ROC from flares. This rule applies to any owners and operators of flares or flare stations where the total rated heat input for the unit is 1 million (MM) BTU per hour or greater. The proposed new rule is based on flare rules adopted in SCAQMD (Rule 1118.1) and SJVAPCD (Rule 4311).

Under Rule 74.35, the NO_x and ROC emissions are reduced by imposing BARCT emission rate limits and requiring facilities to reduce routine or planned flaring by applying annual capacity thresholds. Facilities that exceed these thresholds for 2 consecutive years must submit a Flare Reduction Plans including a Statement of Intent identifying certain paths as specified in the rule to comply with the rule requirements or meet BARCT emission rate limits.

Emission Limits (Section B.1)

Effective January 1, 2024, the new emission limits proposed for newly installed, replaced, or relocated flares are similar to the limits set by SCAQMD Rule 1118.1, and are summarized in Table 2 below:

Table 2: Emission Limits (Rule 74.35 Table 1)

	NOx	CO	ROC
Flare Gas	Pounds/MMBTU		
Digester Gas – Major Source	0.025	0.06	0.038
Digester Gas – Minor Source	0.06	N/A	N/A
Landfill Gas	0.025	0.06	0.038
Produced Gas	0.018	0.01	0.008
Other Flare Gas	0.06	N/A	N/A
ROC Liquid Handling:			
ROC Liquid Holding	0.25	0.37	N/A
ROC Liquid Transfer	Pounds/1,000 gallons loaded		
	0.034	0.05	N/A

Any flare replaced after December 31, 2023 that combusts produced gas at a facility with annual emissions of five or more tpy of ROC or NOx, or 100 tons of CO per year, shall be limited to no more than 110 percent of the average annual throughput to that flare or flare station for the three calendar years immediately preceding the submittal of the flare or flare station application based on the annual emissions reported. If three years of throughput data is not available or the flare is new, the annual throughput shall be limited to 45 million standard cubic feet (MMscf) of fuel per year.

Annual Capacity Thresholds and Requirements (Sections B.2 through B.6)

Owners or operators of a flare or flare station permitted before December 31, 2023, shall determine the annual percent capacity starting with data from calendar year 2024. Table 3 lists the annual capacity thresholds for flares or flare stations permitted before December 31, 2023.

Table 3: Annual Capacity Thresholds (Rule 74.35 Table 2)

Flare gas	Threshold
Digester gas	70%
Landfill gas	20%
Produced gas	20%
All other open flares	5%

Proposed Rule 74.35 establishes capacity thresholds (see Table 3) to identify routine flaring that will apply to existing flares that cannot demonstrate compliance with Rule 74.35 Table 1 – Emission Limits. Facilities will be required to monitor flare throughput monthly. The requirements to monitor monthly capacity and annual percent capacity only apply to open flares or flares combusting digester gas, landfill gas, or produced gas. At the end of each calendar year, the facility must determine if the percent capacity is greater than the Rule 74.35 Table 2 – Annual Capacity Thresholds. If a flare has an annual percent capacity that is greater than the applicable capacity threshold for two consecutive years, the facility must decide to reduce its throughput to below the capacity thresholds, e.g., through a beneficial use project, replace the equipment with a flare that meets Rule 74.35 Table 1 – Emission Limits, demonstrate an existing enclosed flare meets the limits in Rule 74.35 Table 1. Flares combusting “other flare gas” or

"organic liquid handling" do not have to meet the Table 2 – Capacity Thresholds or monitor gas throughput.

Subsections B.4 through B.6 of the rule contain the notification requirements and compliance schedule for flares that have an annual percent capacity that is greater than the capacity threshold for two consecutive years. The schedule allows additional time for flare throughput reduction, as one objective of the rule is to encourage alternatives to flaring. To comply with the tiered schedule and alert VCAPCD staff to the facility's activity, status, compliance option, increment of progress, etc., the facilities must submit the following after the second calendar year exceeding the capacity thresholds in Rule 74.35 Table 2:

- Within 90 days of the end of the second exceeding calendar year, a Flare Reduction Plan (FRP) with a Statement of Intent (SOI) identifying one of the following paths of compliance:
 - Limit throughput for the flare or flare station according to Section B.4; or
 - Replace or modify the flare or flare station according to Subsection B.5 to meet the applicable emission limits in Subsection B.1; or
 - Demonstrate that emission limits in Subsection B.1.a are met for an existing enclosed flare.

Per subsection B.4., facilities opting to limit throughput of the flare or flare station must submit, within 6 months (or 12 months for a publicly owned facility) of the end of the second exceeding calendar year, a Notification of Flare Throughput Reduction (NFTR). The NFTR must include alternative methods to reduce throughput and a timetable to implement and operate the identified methods. Facilities must submit Notifications of Increments of Progress to VCAPCD within 13 months of the second exceeding calendar year, and annually thereafter, identifying actions in the FRP that have been completed, those yet to be completed, and any changes to the original FRP, SOI, or NFTR. The FRP shall be fully implemented within 36 months of the second exceeding calendar year and the facility must demonstrate compliance with the limits in Rule 74.35 Table 2 within 30 days of the end of the next calendar year.

Per subsection B.5, facilities opting to replace or modify the flare must submit an Authority to Construct application to VCAPCD within 6 months (or 12 months for a publicly owned facility) of the end of the second exceeding calendar year. The flare replacement or modification must be completed, and the facility must demonstrate compliance with the emission limits in Rule 74.35 Table 1, within 18 months of VCAPCD issuing the Authority to Construct.

Subsection B.6 requires any owner or operator of a flare or flare station combusting gases identified in Flare 74.35 Table 2 to submit a Notification of Flare Inventory and Capacity within 90 days of rule adoption. This informs the District of each operating flare potentially subject to the annual capacity thresholds and the notification must contain the following information:

- a. Permit number,
- b. Date of flare or flare station installation,
- c. Type of gas combusted,
- d. Maximum rated capacity in MMSCF or MMBTU per hour,
- e. Whether fuel meter is installed
- f. Permitted usage limit, if any, and

g. Date of last source test, if applicable.
VCAPCD has developed a form which will be made available for facilities to use to supply this information.

Additional Requirements (subsections B.7 through B.11)

Subsection B.7. requires owners or operators to conduct maintenance in accordance with the equipment manufacturer's schedule and specifications. Alternately, if no manufacturer's schedule and specifications are available, the owner or operator may conduct maintenance according to the applicable standards in API standard 537, Third Edition, March 2017.

Subsection B.8 requires any flares installed after adoption of Rule 74.35 to label the flare in an accessible location with the flare manufacturer, model number, and rated heat input capacity.

Subsection B.9 requires any new flares installed after December 31, 2023 to be enclosed. Enclosed flare is defined in subsection G.6 as "A flare with the burners shrouded in a stack that is internally insulated to provide wind protection and reduce noise, luminosity, and heat radiation." Sampling ports are also required so the flare can be tested to demonstrate compliance with the emission limits in subsection B.1.

Subsections B.10 and B.11 were included to ensure Rule 74.35 meets EPA requirements for inclusion in the State Implementation Plan (SIP) for Ventura County. EPA previously requested similar language be included as amendments to VCAPCD Rule 71.1 – Crude Oil Production and Separation. Subsection B.10 prohibits operation of a flare that produces visible smoke on a continuous basis. Monthly visual inspections are required using the methods specified in EPA Test Method 22 Visual Determination of Fugitive Emissions From Material Sources and Smoke Emissions From Flares, 40 CFR Part 60 Appendix A.

Subsection B.11 requires owners or operators to operate flares with a continuous pilot light or functional, operating pilotless electronic ignition system. The pilot or ignition system must be tested monthly, and records of the test results and all maintenance activities must be maintained.

Exemptions (Section C)

Subsection C.1 exempts flares with rated heat input less than 1 MMBTU per hour and other flares combusting specific gases and low quantities. Subsection C.2 provides an exemption to flares emitting less than 30 pounds of NO_x per month. Subsection C.3 provides an exemption to flares that operate 200 hours per year or less or combust gases with heat input equivalent to 200 hours of operation at rated capacity. Emergency flaring is not included in the 200-hour or equivalent limit. Subsections C.2 and C.3 require the flare or flare station to have a permit that specifies conditions that limit operations or emissions and require the facility to operate in compliance with those permit conditions. Subsection C.6 specifies that flares or flare stations exempt pursuant to C.2 or C.3 will be subject to the requirements of Section B if they exceed the applicable limitation in subsection C.2 or C.3.

Subsection C.4 allows owners and operators to omit gas throughput and time accrued during emergency flare events, utility pipeline curtailment, external power failure, operating the pilot light, or source testing pursuant to Section E from the calculation of percent capacity pursuant to section B.2 and D.2. “Emergency” is defined in subsection G.5 for the purposes of this rule and covers most situations not under the control of the owner or operator of the flare or flare station.

Subsection C.5 specifies that flares permitted to operate only during an emergency are not subject to the requirements of Subsections B.1-B.3.

Recordkeeping Requirements (Section D)

Subsection D.1 requires owners or operators of a flare or flare station required to comply with Subsection B.2 or C.3 to install and operate a fuel meter for each gas or vapor, excluding pilot gas, routed to every flare or flare station no later than December 31, 2023. The fuel meter is required to be calibrated annually based on the manufacturer’s recommended procedures and records must be kept of the annual calibrations and any maintenance on the fuel meter.

Subsection D.3 requires facilities subject to the requirements of subsections B.10 and B.11 to keep records of the required monthly flare inspections. Subsection D.4 requires records to be maintained for 5 years, which is necessary to satisfy EPA SIP requirements, and allow VCAPCD staff to inspect all required records.

Subsection D.5 requires facilities to submit all records required under Rule 71.1 to the District on an annual basis. This subsection was included to satisfy EPA requirements for periodic reporting. In order to reduce the reporting burden on regulated facilities, the deadline for submitting records is December 31 of the calendar year following the year the records are generated. This allows facilities to continue the practice of submitting records during the annual inspection by District staff, as is the current practice.

Annual Percent Capacity Calculation (Subsection D.2)

Subsection D.2 specifies the procedure for calculating the percent capacity for those facilities subject to subsection B.2. Subject facilities must calculate percent capacity annually starting in January 2024 using the throughput data from calendar year 2023. Monthly throughput, as measured by the fuel meter, and operating hours shall be tracked and recorded at least once per month, less the exclusions cited in Subsection C.4.

Capacity is determined using the manufacturer rated capacity in volume or heat input per hour if known. If this information is not available, the permitted capacity in volume or heat input per hour will be used. For flare stations with a single flow meter in the line feeding the station, the combined total capacity of all flares connected to the single flow meter.

Subsection D.2.d requires facilities subject to the annual capacity thresholds to calculate the annual percent capacity at the end of each calendar year. Facilities may calculate the annual percent capacity based on volume of gas combusted or heat input to the flare. If calculating by volume, the following equation is specified:

$$\text{Percent Capacity}_{\text{MMscf}} = \frac{\text{Total Annual Throughput} \left(\frac{\text{mmSCF}}{\text{year}} \right) / x}{\text{Capacity} \left(\frac{\text{mmSCF}}{\text{hour}} \right)} * 100$$

Where: x = hours per year operated, less the exclusions cited in Subsection C.4.

If determination of throughput capacity is in units of MMBTU/year, the heat input of the flare gas shall be measured and recorded at least once per month in accordance with Subsection E.3. Alternately, for landfill or digester gas, heat input may be calculated and recorded monthly by measuring the methane concentration using a portable nondispersive infrared detector calibrated per manufacturer's specifications. Heat input measurements are not required for months when flare or flare station is not in use. If calculating the annual percent capacity by heat input, the following equation is specified:

$$\text{Percent Capacity}_{\text{MMBTU}} = \frac{\text{Total Annual Throughput} \left(\frac{\text{mmBTU}}{\text{year}} \right) / x}{\text{Capacity} \left(\frac{\text{mmBTU}}{\text{hour}} \right)} * 100$$

Where: x = hours per year operated, less the exclusions cited in Subsection C.4.

Subsection D.2.e requires facilities that fail to record monthly flare usage to use 100% capacity for the time period(s) not recorded. This provision will prevent facilities from benefiting from failure to record usage.

Test Methods and Procedures (Section E)

Subsection E.1 requires facilities complying with subsection B.1 for conduct an initial source test to demonstrate compliance within 12 months from adoption of Rule 74.35. The initial source test shall be conducted while the flare is operating in accordance with conditions set forth in the Authority to Construct permit. Open flares are not required to conduct source tests.

Subsections E.2 through E.5 list the source test methods to be used. Subsection E.6 specifies that source tests shall be averaged over a maximum of 60 minutes of flare operation and E.7 states that source tests shall be conducted in as-found operating conditions. Subsection E.8 requires source test protocols to be submitted to the District at least 30 days in advance of the test date for review and approval.

Subsection E.9 addresses condensate injection to flares. If a landfill injects condensate into a flare for incineration, source testing must be conducted with condensate injection on and the injection rate must be recorded at 10-minute intervals. The condensate injection rate for the tested flare will be limited to the rate observed at the most recent compliant source test or lower.

Subsection E.10 specifies the method used to monitor for visible emissions from the flare. Facilities shall use methods in section 11 of the US EPA Method 22 Visual Determination of Fugitive Emissions From Material Sources and Smoke Emissions From Flares, 40 CFR Part 60 Appendix A. The observation period shall be 15 minutes.

Violations (Section F)

Failure to comply with any provision of the rule will constitute a violation of the rule.

Definitions (Section G)

Key terms used in Rule 74.35 are defined in this section.

COMPARISON OF RULE REQUIREMENTS WITH OTHER AIR POLLUTION CONTROL REQUIREMENTS

CHSC Section 40727.2 requires Districts to compare the requirements of a proposed rule or proposed amendments to a rule with other air pollution control requirements. These other air pollution control requirements include federal New Source Performance Standards (NSPS), federal National Emissions Standards for Hazardous Air Pollutants (NESHAPS), federal Best Available Control Technology (BACT) determinations, and any other VCAPCD rule that applies to the same equipment.

Staff reviewed the federal RACT/BACT/LAER Clearinghouse (RBLC) data for flares and found the emission limits in permits issued between January 1, 2005 and June 22, 2023 were equivalent to or less restrictive than the limits in proposed Rule 74.35.

Federal NSPS and NESHAP regulations apply to industries that use flares as control devices, such as petroleum refineries, organic chemical manufacturing facilities, crude oil production and processing facilities, and municipal solid waste landfills. The federal regulations do not contain specific emission limits such as those in subsection B.1 of proposed Rule 74.35. In addition, they do not contain capacity thresholds and requirements for flare reduction plans like proposed Rule 74.35.

Federal general control device and work practice requirements for facilities subject to NSPS include 40 CFR Part 60.18 subsections (b) through (f) and for facilities subject to NESHAP include 40 CFR Part 63.11 subsection (b). The NSPS and NESHAP requirements for flares are very similar. Both Rule 74.35 and the federal regulations require flares to be operated with no visible emissions and monitored in accordance with Method 22. The federal regulations specify heat content requirements, flare tip velocity standards, and requirements based on whether the flare is steam-assisted, air-assisted, or nonassisted that are not addressed in Rule 74.35.

District Rule 71.5 Glycol Dehydrators includes requirements in subsection B.1.b for systems using a flare or incinerator to combust ROC emissions from regulated sources. Rule 71.5 requires flares to operate continually in a smokeless mode similar to Rule 74.35. Rule 71.5 has additional requirements for an electronic ignition system with a malfunction alarm if the pilot flame fails, a liquid knock out system to remove condensable vapors, and sight glass ports if the flame is not visible. No other District rules include limits or requirements for flares.

IMPACTS OF THE PROPOSED RULE

Emissions Impacts

The majority of flares are operated at landfills and oil and gas production facilities combusting the most gas, and resulting in the highest NO_x emissions. Staff estimates there will be 4 affected flares that will need to take action which result in emissions reductions of approximately 6.916 tons per year (tpy) of NO_x and 6.069 tpy of ROG. These emission reductions are likely an underestimation, since they are based solely on flare replacement and do not include potential additional reductions from flare minimization, beneficial use, or future installations of ultra-low NO_x flares.

These reductions from this source category are significant, and all emission reductions are needed to reach the federal and state ambient ozone air quality standards.

Cost-Effectiveness

VCAPCD staff expects most flares in Ventura County will be able to comply with this rule through operational changes and that most existing flares will not require replacement to meet the new emission standards. Only flares that exceed the annual capacity thresholds in Table 2 of this rule and choose to comply through by replacing the flare or flare station as allowed by B.3.b will incur short term capital costs from this Rule.

Cost effectiveness is evaluated based on the average costs determined by SCAQMD in their Rule 1118.1 flare rulemaking in 2019. Emission reductions were calculated for the four flares District staff determined most likely to require replacement due to high utilization. District data on these flares is incomplete and the flares may not require replacement if utilization is lower than the utilization estimated by the District staff or if operators can modify operations to reduce flaring.

Combined ROG and NO_x reductions cost effectiveness is shown below and compared them to the BARCT threshold of \$30,000/ton threshold for ROG adopted by the VCAPCD Board on November 12, 2019. The cost effectiveness for NO_x adopted at on the same date is \$39,000/ton. These costs are a worst-case cost effectiveness for facilities that choose to comply by flare replacement rather than by limiting flare throughput or by demonstrating that the emission limits in Table 1 of the rule are met.

Pollutant (tpy)	Avg Reductions (tpy)	Cost effectiveness (\$/ton)
ROG	1.52	59,727
NO _x	1.73	52,404
ROG+NO _x	3.25	27,913
BARCT ROG Threshold: \$30,000 per ton		

Cost effectiveness was evaluated using an equipment life of 20 years and an interest rate of 4%. The life span is based flare manufacturer promotional materials. Staff expects flare lifetimes to

exceed 20 years in practice. The interest rate is the interest rate of the 10-year treasury note rounded up to the next whole percent. Costs determined by SCAQMD in 2019 were indexed for the increase in chemical plant equipment cost increases using the Chemical Engineering Plant Cost Index (CEPCI).

Flares that are replaced due to equipment wear or as the result of operational changes will be required by this rule to use an enclosed flare instead of an open flare. In most cases, Best Available Control Technology (BACT) requires that an enclosed flare be used. When BACT applies to new equipment permitted by the facility, this rule imposes no additional capital costs. This rule would impose small operational costs for the testing and maintenance requirements of this rule, but these costs are negligible compared to capital and existing operational costs.

Incremental Cost-Effectiveness Analysis

CHSC Section 40920.6(a) requires districts to identify one or more potential control options, assess the cost-effectiveness of those options, and calculate the incremental cost-effectiveness. CHSC Section 40920.6 also requires an assessment of the incremental cost-effectiveness for proposed regulations relative to ozone, carbon monoxide (CO), sulfur oxides (SO_x), nitrogen oxides (NO_x) and their precursors. Incremental cost-effectiveness is defined as the difference in control costs divided by the difference in emission reductions between two potential control options achieving the same emission reduction goal of a regulation.

Proposed rule 74.35 only requires flares that surpass the Table 2 Annual Capacity Threshold to be replaced or for flare throughput be reduced. The progressively more stringent control option is to require all flares emitting higher than the Table 1 – Emission Limits to be replaced if they do not meet any of the proposed exemptions.

An incremental cost-effectiveness analysis was performed by SCAQMD in their 2019 rule analysis for their Rule 1118.1 – Control of Emissions from Non-Refinery Flares. The incremental cost-effectiveness was over \$140,000 per ton of NO_x reduced for produced gas flares, and even more for flares at other types of regulated facilities. Thus, the progressively more stringent control option was rejected due to high implementation cost.

Socio-Economic Impact

The provisions of Section 40728.5 of the California Health and Safety Code requires a socioeconomic impact analysis whenever the air quality or emissions limitations will be significantly affected. The Board must evaluate the following socioeconomic information on proposed new Rule 74.35.

- (1) The type of industries or businesses, including small business, affected by the rule or regulation.

This rule may directly affect the following industries in Ventura County:

Crude oil production, municipal solid waste landfills, wastewater treatment facilities, and facilities such as composting and agricultural product processors

using anaerobic digesters to process organic materials. None of the businesses with permitted flares subject to Rule 74.35 are small businesses.

- (2) The impact of the rule on employment and the economy of the region.

This rule is not expected to have a negative impact on either employment or the economy of Ventura County. Worst-case cost estimates for the end user are not significant enough to impact employment.

- (3) The range of probable costs, including costs to industry or business, including small business, of the rule or regulation.

Analysis of flare usage by the facilities that will be subject to Rule 74.35 indicated most facilities will not incur significant costs because they do not exceed the capacity thresholds and will not need to replace existing equipment. Minor costs incurred due to monthly monitoring requirements and installation of flow meters (if not already installed) will not be significant.

The few flares staff determined may need to replace an existing flare would incur capital costs ranging from \$545,000 to \$1,335,214 and indirect annual costs from \$32,250 to \$170,649. The annualized cost considering a lifespan of 25 years range from \$70,919 to \$265,385.

- (4) The availability and cost-effectiveness of alternatives to the rule or regulation being proposed.

Proposed new Rule 74.35 is the most cost-effective control option, since it requires capital expenditures only for those operators with flares exceeding the proposed capacity thresholds. Other control alternatives, such as the imposition of emission limits on all flares, are not cost-effective for this source category.

- (5) The emissions reduction potential of the rule.

The anticipated emission reduction potential of the proposed rule is approximately 6.916 tons of NO_x and 6.069 tons of ROC per year. These emission reductions result from improved flare control.

- (6) The necessity of adopting, amending, or repealing the rule or regulation in order to attain state and federal ambient air standards pursuant to Chapter 10 (commencing with Selection 40910).

Ventura County is classified as a nonattainment area for both the state and federal Ambient Air Quality Standards for ozone. These proposed rule amendments will reduce NO_x and ROC emissions which are precursors to the formation of ozone. According to the District's 2016 AQMP, these emissions reductions will help the

District in its effort to attain the standards. CHSC Section 40914(b)(2) requires that the District adopt every feasible measure to reduce ozone precursors.

ENVIRONMENTAL IMPACTS OF METHODS OF COMPLIANCE

California Public Resources Code Section 21159 requires the District to perform an environmental analysis of the reasonably foreseeable methods of compliance. The analysis must include the following information on Proposed Rule 74.35.

- (1) An analysis of the reasonably foreseeable environmental impacts of the methods of compliance.
- (2) An analysis of the reasonably foreseeable mitigation measures.
- (3) An analysis of the reasonably foreseeable alternative means of compliance with the rule or regulation.

All reasonably foreseeable compliance methods, the environmental impacts of those methods, and measures that could be used to mitigate the environmental impacts are summarized in Table 2 below.

Table 2 Environmental Impacts and Mitigations of Methods of Compliance

Compliance Methods (including all reasonably foreseeable alternative means of compliance)	Reasonably Foreseeable Environmental Impacts	Reasonably Foreseeable Mitigation Measures
Replace open flare with low NOx enclosed flare	None – reduced emissions will improve air quality	Not applicable
Reduce flare use by redirecting gas to natural gas pipeline for sale.	Air quality impacts: Gas can leak from sales system and will likely be combusted elsewhere	Proper maintenance of gas lines prevents leaks. Other sources of natural gas would be combusted regardless of beneficial use prompted by this rule.
Reduce flare use by combusting on-site in engine or turbine for beneficial use.	Noise impacts: combustion in engine or turbine may increase noise levels. Air quality impacts: NOx emissions from beneficial use could be greater than NOx from flare	Noise mitigation: Sound wall or enclosures may be constructed around the equipment. Air quality mitigation: additional NOx control such as selective catalytic reduction could be installed on engines or turbines.

This analysis demonstrates that the adoption of Rule 74.35 will not have a significant effect on the environment due to unusual circumstances.

PUBLIC ENGAGEMENT AND COMMENTS

Public Workshops

District staff held two public workshops for the proposed rule. The first was held on May 13, 2022 and the second was held on June 6, 2023. All facilities with permitted sources potentially subject to proposed Rule 74.35 were informed of the workshops. District staff engaged in extensive discussions and correspondence with industry, including industry associations, in the period between the two workshops. As a result, District staff was able to develop proposed Rule 74.35 with requirements that the regulated industry could support.

Advisory Committee

The Advisory Committee met on June 27, 2023 to consider proposed Rule 74.35. Industry representatives at the meeting supported the proposed rule requirements. The Advisory Committee voted unanimously (11 to 0) to recommend adoption of Rule 74.35.

After the Advisory Committee meeting, staff received comments from Clean Water SoCal, representing wastewater treatment plants in Ventura County that have digester gas flares. They had concerns about cost-effectiveness of requiring minor source flares to meet major source BACT emissions limits. Staff reviewed information provided by Clean Water SoCal and determined it was appropriate to include the minor source limits for digester gas flares from South Coast AQMD Rule 1118.1. District staff also made some clarifying edits to the periodic reporting requirements on the advice of District Counsel.

Since the draft rule was changed after the June 27, 2023, Advisory Committee meeting, District staff scheduled a second Advisory Committee meeting on August 15, 2023 to present the revised rule for consideration.

Air Pollution Control Board Public Hearing

Staff has scheduled a public hearing to consider adoption of Rule 74.35 before the Ventura County Air Pollution Control Board on September 12, 2025. The public notice will be published on August 4, 2023.

REFERENCES

1. American Petroleum Institute, API STD 537, 3rd Edition, March 2017 - Flare Details for Petroleum, Petrochemical, and Natural Gas Industries
2. South Coast AQMD Board Meeting, "Adopt Proposed Rule 1118.1 – Control of Emissions from Non-Refinery Flares," January 4, 2019