

PROPOSED AMENDED RULE 1147 PUBLIC WORKSHOP

JANUARY 27, 2022
SOUTH COAST AQMD
DIAMOND BAR, CA

Zoom Meeting:
Zoom Webinar ID:
Conference Call:

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Agenda

- ❑ Rule 1147 Background
 - Rule Applicability
 - Impacted Equipment Universe
- ❑ Proposed Rule Language Overview
 - Rule Structure Update
 - Retained and Deleted Subdivisions
 - New Limits and Requirements
- ❑ Emission Reductions, Cost-Effectiveness, and Incremental Cost-Effectiveness
- ❑ Scope of Socioeconomic Impact
- ❑ California Environmental Quality Act (CEQA)
- ❑ Next Steps



RULE 1147 BACKGROUND



Background

- In March 2017, the South Coast AQMD adopted the 2016 AQMP
 - Control measure CMB-05 instructed staff to transition the RECLAIM program to a command-and-control regulatory structure
 - Requires a 5 ton per day NO_x emission reduction to be achieved with Best Available Retrofit Control Technology (BARCT) as soon as practicable and no later than 2025
- In July 2017, Assembly Bill 617 was signed by the Governor
 - Requires expedited BARCT implementation for facilities in the state greenhouse gas cap and trade program
 - Assigns the highest priority to those permitted units that have not modified emissions related permit conditions for the greatest period of time

Background

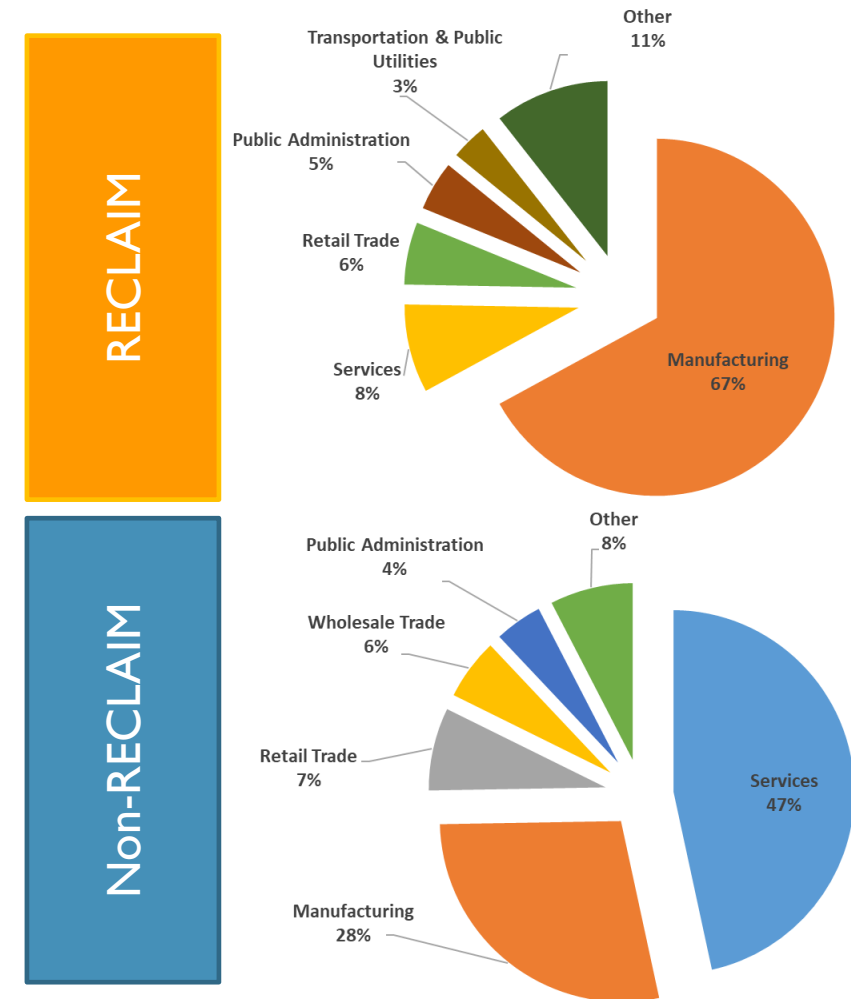
Proposed Rule Applicability

- ❑ Rule 1147 – NO_x Reductions from Miscellaneous Sources was initially adopted in December 2008 and established NO_x limits for a wide variety of miscellaneous sources at non-RECLAIM facilities
- ❑ Proposed Amended Rule 1147 (PAR 1147) will include the original non-RECLAIM equipment universe from existing Rule 1147 while adding applicability for RECLAIM facilities
- ❑ PAR 1147 will also include:
 - Updated NO_x emission limits based on category technology assessment
 - New CO emission limit for all applicable equipment
 - New monitoring and recordkeeping requirements

Background

Impacted Equipment

- ❑ PAR 1147 will impact roughly 5,300 units located at approximately 3,000 facilities
 - Including 85 RECLAIM facilities
- ❑ Industries impacted are mostly in the manufacturing and services sector
- ❑ RECLAIM facilities show higher representation in the manufacturing sector while non-RECLAIM facilities show higher representation in the services sector





**PROPOSED AMENDED RULE 1147- NO_x REDUCTIONS FROM
MISCELLANEOUS SOURCES**
RULE LANGUAGE OVERVIEW



Proposed Amended Rule 1147

Summary of Rule Structure Updates

- ❑ Structure of PAR 1147 language to be updated for improved clarity
 - Goal is for conformity of structure of all Rule 1147 series rules
- ❑ Changes include:
 - Removing rule language with outdated language
 - Restructuring existing paragraphs into more defined subdivisions
 - Adding additional rule language to implement BARCT and RECLAIM sunset

Proposed Amended Rule 1147

Deleted Subdivisions

❑ The following subdivisions were removed from PAR 1147

(g) Enforcement

- Elements of enforcement are incorporated into other subdivisions of PAR 1147
- No changes to the overall enforcement requirements of Rule 1147

(h) Technology Assessment

- Technology Assessment referenced in this subdivision was completed and referenced in the 2017 amendment of Rule 1147

(i) Mitigation Fee Compliance Option

- Mitigation fee compliance option is no longer necessary with latest compliance schedule for PAR 1147

Proposed Amended Rule 1147

Retained Subdivisions

- ❑ The following subdivision was retained from the 2017 Amendment of Rule 1147 and no changes were made

(e) Certification

- Moved to subdivision (k) in PAR 1147
- Language for this subdivision has been updated to improve clarity
- Subdivision implementation remains unchanged compared to Rule 1147

OVERVIEW OF RULE STRUCTURE UPDATE

Current Rule 1147

Subdivision	Title
(a)	Purpose and Applicability
(b)	Definitions
(c)	Requirements
(d)	Compliance Determination
(e)	Certification
(f)	Enforcement
(g)	Exemptions
(h)	Technology Assessment
(i)	Mitigation Fee Compliance Option



Proposed Amended Rule 1147

Subdivision	Title
(a)	Purpose
(b)	Applicability
(c)	Definitions
(d)	Emission Requirements
(e)	Compliance Schedule
(f)	Burner Age
(g)	Determination of Less than One Pound of NOx Per Day
(h)	Monitoring and Source Testing
(i)	Labeling Requirements
(j)	Reporting and Recordkeeping
(k)	Certifications
(l)	Maintenance
(m)	Exemptions

Proposed Amended Rule 1147

Purpose (a) and Applicability (b) – Language Updates

Purpose

“The purpose of this rule is to reduce nitrogen oxide (NOx) emissions while limiting carbon monoxide (CO) emissions from gaseous and liquid fuel fired combustion equipment as defined in this rule.”

Applicability

“This rule applies to manufacturers, distributors, retailers, installers, owners, and operators of combustion equipment with NOx emissions that require a South Coast AQMD permit and are not specifically required to comply with requirements of other South Coast AQMD Regulation XI combustion rules.

- ❑ PAR 1147 contains updated language for purpose and applicability to improve clarity
- ❑ Purpose and Applicability are moved into individual subdivisions
- ❑ Applicability extends to all permitted equipment in non-RECLAIM, RECLAIM and former RECLAIM facilities that are not required to comply with requirements of other South Coast AQMD Regulation XI combustion rules

Proposed Amended Rule 1147

Definitions (c) – New Definitions

- ❑ PAR 1147 includes added following definitions to assist in RECLAIM transition
 - Former RECLAIM Facility
 - RECLAIM Facility
 - Non-RECLAIM Facility
- ❑ Additional key definitions added to provide clarity on applicability of newly added equipment categories and compliance pathways, such as:
 - Autoclave
 - Chiller
 - Decommission
 - Tunnel Kiln
 - Turbine

Proposed Amended Rule 1147

Requirements (d) – Interim Limits

- ❑ Interim limits are established for applicable equipment located at non-RECLAIM and former RECLAIM facilities until required to meet proposed NOx emission limits
 - RECLAIM and Former RECLAIM units must comply with an interim emission limit of 102 ppm NOx or NOx limit specified in existing equipment permit, whichever is lower
 - Non-RECLAIM units must continue to demonstrate compliance with existing Rule 1147 requirements specified in PAR 1147 Table 1
- ❑ RECLAIM, Former RECLAIM and Non-RECLAIM units must comply with new tightened emission limits of PAR 1147 Table 2 in accordance with compliance schedule in subdivision (e)

Proposed Amended Rule 1147

Requirements (d) – PAR 1147 Table 2 (Part 1 of 2)

Equipment Category	Operating Temperature	Current Rule Limit [^]	PAR 1147 Emission Limit [^]
Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	<1,200°F	30 ppm	20 ppmv (0.024 lb/mmBtu)
	≥1,200°F	60 ppm	30 ppmv (0.036 lb/mmBtu)
Tunnel Dryers	<1,200°F	30 ppm	30 ppmv (0.036 lb/mmBtu)
	≥1,200°F	60 ppm	60 ppmv (0.073 lb/mmBtu)
Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator	All	60 ppm	20 ppmv (0.024 lb/mmBtu)
Evaporator, Fryer, Heated Process Tank, and Parts Washer	All	60 ppm	60 ppmv (0.073 lb/mmBtu)
Burn-off Furnace, Burnout Oven, Incinerator, Crematory with or without Integrated Afterburner	All	60 ppm	30 ppmv (0.036 lb/mmBtu)
Tenter Frame, Fabric or Carpet Dryer	All	30 ppm	20 ppmv (0.024 lb/mmBtu)
Rotary Dryers	All	30 ppm	30 ppmv (0.036 lb/mmBtu)
Other Unit and Process Temperature	<1,200°F	30 ppm	30 ppmv (0.036 lb/mmBtu)
	≥1,200°F	60 ppm	60 ppmv (0.073 lb/mmBtu)

[^] NOx concentrations are corrected to 3% O₂ dry, unless otherwise specified

Proposed Amended Rule 1147

Requirements (d) – PAR 1147 Table 2 (Part 2 of 2)

Equipment Category	Operating Temperature	Current Rule Limit [^]	PAR 1147 Emission Limit [^]
Chillers	All	30 ppm	20 ppmv (0.024 lb/mmBtu)
Micro-Turbines (All Other)	All	N/A	9 ppmv* (0.011 lb/mmBtu)
Micro-Turbines (In-Use Distillate Fuel)	All	40 ppm	77 ppmv ² (0.094 lb/mmBtu)
Auto-Claves	All	30 ppm	30 ppmv (0.036 lb/mmBtu)
All Liquid Fuel-Fired Units	<1,200°F	40 ppm	40 ppmv (0.053 lb/mmBtu)
	≥1,200°F	60 ppm	60 ppmv (0.073 lb/mmBtu)

All equipment subject to PAR 1147 to be subject to CO emission limit of 1,000 ppmv[^]

[^] NOx concentrations are corrected to 3% O₂ dry, unless otherwise specified

^{*} NOx concentrations for micro-turbines are corrected to 15% O₂ dry

¹ Proposed BARCT limit is at existing equipment permit limit, no further action required

² Proposed emission limit applies for in-use equipment with annual fuel usage of less than 13,800 gal/year

Proposed Amended Rule 1147

Requirements (d) – Less Than One Pound Per Day NOx

- ❑ An owner or operator of a Unit with daily NOx emissions of below one pound per day to be exempt from NOx and CO emission limits of PAR 1147
 - For existing units, owner and operator must submit a permit application to add permit condition limiting daily NOx emissions to less than one pound per day prior to January 1, 2023
 - New units must obtain a permit that limits NOx emissions to one pound per day at the time of permit issuance
- ❑ Owners or operators that fail to continuously demonstrate NOx emissions of less than one pound per day shall
 - Submit application within six months after failure to demonstrate less than one pound NOx per day
 - Demonstrate compliance with emission limits of PAR 1147 Table 2 within 12 months after permit to construct is issued
- ❑ Emissions of less than one pound NOx per day must be calculated according to methods specified in PAR 1147 subdivision (g)

Proposed Amended Rule 1147

Compliance Schedule (e) – Compliance Pathways

- ❑ PAR 1147 provides two implementation pathways:
 - Paragraph (e)(1) - All units, except units complying with existing Rule 1147 limits, must submit permit applications to meet the proposed NOx and CO limits when the burner reaches 12 years
 - Paragraph (e)(2) - Units complying with existing Rule 1147 limits must submit permit applications to meet the proposed NOx and CO limits when the burner reaches 32 years
- ❑ For equipment at or beyond the 12- or 32-years age, as of January, submit permit by July of the same year
 - Starting in the year 2023 and every year thereafter
- ❑ Proposed NOx and CO limits must be met if there is a combustion system modification or replacement, burner replacement, unit relocation, or unit replacement
- ❑ Units that meet the proposed NOx and CO limits of PAR 1147 Table 2 through a source test will need to modify their permit to reflect the tightened limit

Proposed Amended Rule 1147

Compliance Schedule (e) – Alternative Compliance Schedule

- ❑ PAR 1147 will retain existing alternative compliance schedule for specific equipment categories identified in existing Rule 1147
- ❑ Alternative compliance schedule outlined in PAR 1147 Table 3 will provide identified equipment categories additional time to comply with emission limits of PAR 1147

PAR 1147 Table 3 – Alternative Compliance Schedule

Equipment Category(ies)	Permit Application Submittal Deadline	Compliance Deadline
Specific Unit		
Remediation Unit manufactured and installed prior to March 1, 2012 with an active South Coast AQMD permit	Seven months prior to a combustion system modification, combustion system replacement or Unit Replacement or a Relocation.	Upon combustion system modification, combustion system replacement or Unit replacement or relocation
Evaporator, heated process tank, or parts washer operating prior to January 1, 2014 with an active South Coast AQMD permit	Seven months prior to combustion system modification, combustion system replacement or unit replacement	Upon combustion system modification, combustion system replacement or Unit replacement

Proposed Amended Rule 1147

Compliance Schedule (e) - Decommission

Paragraph (e)(4):

An owner or operator that elects to Decommission a Unit, in lieu of meeting the concentration limit requirements of Table 2 pursuant to subdivision (h) shall:

- A. Submit a permit application on or before the permit application submittal date pursuant to the implementation schedule in subparagraph (e)(1)(A) or (e)(2)(A) to take a permit condition to Decommission the Unit no later than 30 months after the permit application submittal date; and*
- B. Decommission the Unit no later than 30 months after the permit application submittal date by disconnecting all fuel, air, and electricity to the Unit.*

- ❑ Paragraph (e)(4) provides the option for owners and operators of applicable equipment to decommission in lieu of meeting tightened emission limits of PAR 1147 Table 2
- ❑ Owners and operators electing to comply with this option must deactivate their permit to operate

Proposed Amended Rule 1147

Compliance Schedule (e) – Facilities with Five or More Units

- ❑ Implementation schedule for multiple units apply for facilities with 5 or more pieces of equipment with the permit application submittal date of July 1, 2023
 - Implementation schedule based on % of total heat input of applicable units
- ❑ Owner or operator would need to submit applications in accordance with application submittal dates in the table below:
(percentages rounded up to nearest whole number of unit(s))

Application Submittal Date	5 to 9 units (% of Total Heat Input)	10 to 19 units (% of Total Heat Input)	20+ units (% of Total Heat Input)
July 1, 2023	50%		
July 1, 2024	100%	50%	33%
July 1, 2025	Not Applicable		
July 1, 2026		100%	67%
July 1, 2027			
July 1, 2028		Not Applicable	100%

Proposed Amended Rule 1147

Burner Age Determination (f) – Methods

- ❑ Burner age for applicable units must be determined by:
 1. Invoice from burner manufacturer for purchase of burner equipment
 2. Information submitted to the South Coast AQMD with applications for permit prior to date of rule adoption for the specific burner
 3. Original unit manufacturer's identification or rating plate permanently affixed to the Unit
 4. Any other method of determining burner age that can be substantiated through sufficient written information as approved by the Executive Officer
- ❑ Applicable Units without the aforementioned documents will be deemed 32 years old as of January 1, 2023

Proposed Amended Rule 1147

Less than One Pound of NOx per Day (g) – Methods

- ❑ PAR 1147 subdivision (g) specifies two methods to determine emissions of less than one pound per day:
 1. Calculation of usage based on unit specific non-resettable time meter
 2. Calculation of usage based on unit specific non-resettable fuel meter
- ❑ Owners or operators calculating maximum daily operating minutes with Equation 1 or maximum daily therms of fuel in Equation 2, must determine unit emission factor with a South Coast AQMD approved method (e.g. source test)

Equation #1:

$$\text{Daily Operating Minutes} = 60 \text{ minutes/hour} \div [R \times (EF \div \text{HHV})]$$

Where,

R = Rated Heat Input (MMBtu/hr),

EF = Emission Factor for the Unit (lbs NOx/MMScf natural gas),

HHV = Higher Heating Value of Natural Gas (1,050 MMBtu/MMScf)

Equation #2:

$$\text{Daily Therms of Fuel} = (1 \div EF) \times \text{HHV} \times 10$$

Where,

EF = Emission Factor for the Unit (lbs NOx/MMScf natural gas)

HHV = Higher Heating Value of Natural Gas (1,050 MMBtu/MMScf)

10 = Conversion from MMBtu to Therms

Proposed Amended Rule 1147

Monitoring and Source Testing (h) – Protocols and Methods

- ❑ Source test to be conducted during normal operating conditions and in the maximum heat input range of normal operation
- ❑ Source test protocol must be submitted for approval within 90 days prior to scheduled source test
 - Test to be conducted during this 90-day period or within 30 days after approval, whichever is later
 - Not required to resubmit protocol for subsequent source tests assuming burner was not modified
- ❑ Compliance determination must be determined using a South Coast AQMD approved contractor under the Laboratory Approval Program and approved methods specified in paragraph (h)(5)
- ❑ Pound per million btu and compliance by certification option are retained from Rule 1147

Proposed Amended Rule 1147

Monitoring and Source Testing (h) – Periodic Monitoring

Equipment Size	Source Testing Schedule	Elapsed Time Prior to Previous Source Test
<10 MMBtu/hr	Every 5 Calendar Years	48 calendar months
<40 and ≥10 MMBtu/hr	Every 3 Calendar Years	24 calendar months
≥40 MMBtu/hr	Every Calendar Year	6 calendar months

- ❑ PAR 1147 introduces new periodic monitoring requirement for applicable equipment with daily NO_x emissions greater than or equal to one pound
- ❑ Units >40 MMBtu/hr that have not operated in at least 6 consecutive calendar months may conduct source test within 90 days of resumed operation
- ❑ In-use units must conduct source test within 24 months of date of rule adoption which will establish source testing schedule

Proposed Amended Rule 1147

Maintenance (I) – Details

- ❑ Maintenance requirements were previously required under Rule 1147 paragraph (d)(7)
- ❑ New subdivision for maintenance added to PAR 1147 to improve clarity on applicability of maintenance requirement for all units subject to Subdivision (d) – Requirements
- ❑ Units must perform maintenance in accordance with manufacturer specifications
 - No change to the maintenance requirements of Rule 1147

Proposed Amended Rule 1147

Exemptions (m) – Updates

- ❑ PAR 1147 removes exemptions for RECLAIM facilities
- ❑ The following exemptions are added to PAR 1147:
 - Units with heat input ratings below 325,000 btu/hr
 - Tunnel Kilns with CEMS during periods of startup and shutdown of less than 180 minutes



PROPOSED AMENDED RULE 1147

EMISSION REDUCTIONS, COST-EFFECTIVENESS, AND INCREMENTAL COST-EFFECTIVENESS



Emission Reductions

- ❑ Emission reductions were calculated on per unit basis using:
 - Annual Reported Fuel Usage;
 - Current Permit Limit or Emission Factor;
 - Source Test Results (if available); and
 - Staff Proposal
- ❑ Proposed Amended Rule 1147 will reduce NOx emissions from applicable equipment by:
 - 0.54 tons per day (tpd) by July 1, 2025; and
 - 1.59 tpd by full implementation date estimate of July 1, 2057

Cost-Effectiveness

- ❑ Cost-effectiveness is calculated using Discounted Cash Flow Method (DCF)
- ❑ Costs were obtained from:
 - Vendor discussions (Equipment and Installation)
 - Staff report for the December 2018 amendments to the Rule 1146 series (Equipment and Installation)
 - Facility provided quotations
- ❑ Cost-effectiveness is calculated using emission reductions from existing permit limit, source test results (if available) and staff proposal
- ❑ Some categories identified have a cost effectiveness of “no additional cost” or \$0/ton due to BARCT matching existing limits

Incremental Cost-Effectiveness

- ❑ Incremental cost-effectiveness assessment was conducted to evaluate and compare two identified pollution control technologies applicable to PAR 1147:
 - Ultra Low-NOx burners
 - Selective Catalytic Reduction (SCR) systems
- ❑ Majority of equipment impacted by PAR 1147 are below 5 mmbtu/hr and not suitable for SCR applications
- ❑ Incremental cost-effectiveness analysis was conducted for one identified RECLAIM major source Tunnel Kiln
 - Duct burners were required for SCR applications on this tunnel kiln due to low exhaust temperature
 - Result of incremental cost-effectiveness for identified tunnel kiln was calculated to be not cost-effective

Cost-Effectiveness

Category Specific Cost-Effectiveness (1 of 2)

Equipment Category	Operating Temperature	Cost-Effectiveness
Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank	<1,200°F	\$12,700/Ton
	≥1,200°F	\$5,600/Ton
Tunnel Dryers	<1,200°F	\$49,200/Ton
	≥1,200°F	No Additional Cost ¹
Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator	All	\$12,300/Ton
Evaporator, Fryer, Heated Process Tank, and Parts Washer	All	\$31,300/Ton
Burn-off Furnace, Burnout Oven, Incinerator, Crematory with or without Integrated Afterburner	All	\$25,800/Ton
Tenter Frame, Fabric or Carpet Dryer	All	\$23,600/Ton
Rotary Dryers	All	No Additional Cost ¹
Other Unit and Process Temperature	<1,200°F	No Additional Cost ¹
	≥1,200°F	

¹Proposed BARCT limit is at existing equipment permit limit, no further action required

Cost-Effectiveness

Category Specific Cost-Effectiveness (2 of 2)

Equipment Category	Operating Temperature	Cost-Effectiveness
Absorption Chillers	All	No Additional Costs ¹
Micro-Turbines (All Other)	All	No Additional Costs ¹
Micro-Turbines (In-Use Distillate Fuel)	All	No Additional Costs ¹
Auto-Claves	All	\$49,000
All Liquid Fuel-Fired Units	<1,200°F	No Additional Costs ¹
	≥1,200°F	No Additional Costs ¹

¹Proposed BARCT limit is at existing equipment permit limit, no further action required



PROPOSED AMENDED RULE 1147

SOCIOECONOMIC IMPACT ASSESSMENT AND CALIFORNIA ENVIRONMENTAL QUALITY
ACT (CEQA)



SCOPE OF SOCIOECONOMIC IMPACT ASSESSMENT

- California Health and Safety Code Section 40440.8
 - Requires socioeconomic impact assessment for proposed rule or rule amendment which “will significantly affect air quality or emissions limitations”
 - Socioeconomic impact assessment takes into consideration:
 1. Type of affected industries, including small businesses
 2. Range of probable costs, including costs to industry or business
 3. Impact on employment and regional economy

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

- ❑ PAR 1147 is subject to CEQA
- ❑ South Coast AQMD is reviewing the proposed project to determine if it will result in any environmental impacts
- ❑ Appropriate CEQA documentation will be prepared

Next Steps

End of Comment Period on February 9, 2022

Stationary Source Committee Meeting on February 18, 2022

Set Hearing on March 4, 2022

Public Hearing on April 1, 2022

CONTACTS

General RECLAIM Questions	Proposed Amended Rules 1147 and 1100	Proposed Amended Rules 1147, 1100 and Proposed Rule 1147.2
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